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The Outlook

Back to Bleriot?

A LETTER on the Correspondence page of this issue draws attention to the work being done in the United States of America on the development of castering undercarriages. The writer of the letter, our very good friend Mr. T. P. Wright, is anxious to dispel any idea that the Civil Aeronautics Administration does not give full credit to the work done over a period of years in Great Britain by Mr. Maclaren.

There are several points of especial interest in this letter. For example, the statement that although much has been accomplished there does not appear to be any great interest in the castering undercarriage in this country. Mr. Wright may well be surprised at that. The Maclaren undercarriage was given very thorough try-outs on different types of undercarriages, and the results were certainly promising. But apparently nobody in authority realized its great potential advantages. We published an article on some of this work in our issue of March 16th, 1944.

It is interesting to find that in the American developments the pre-setting of the wheels has been discarded in favour of automatic action. As Mr. Wright says, that basic conception goes back to the earliest days of flying. The Bleriot cross-Channel monoplane, and a long family of subsequent types, had castering wheels, and there was a centring device which brought the wheel back into a fore-and-aft plane when the load was taken off, viz., when the machine was airborne.

Older readers of this journal will certainly remember how Gustav Hamel, one of the greatest exponents of the Bleriot, used to land at Hendon with complete disregard for heading into wind. On the first light touch the wheels used to flick outwards, and as the machine settled gradually it would slither along crabwise until it came to rest. It looked somewhat risky, as the wheel track was not very wide, but we have never seen a Bleriot turn over sideways.

Starting was always a difficulty. The regular procedure for pupils at the Bleriot flying school at Hendon was: open the throttle; a violent swing; throttle back; jump out and lift the tail around until the machine was again facing into wind; jump into the cockpit again, and the whole performance was repeated.

The Modern Version

THIS reminiscence of the old flying days is mentioned because it may have a bearing on the modern castering undercarriage. The idea is to make possible a reduction in the number of runways by enabling aircraft to take off and land many degrees off-wind. In the British experiments with the Maclaren undercarriage to which we referred above, the wheels were, we believe, pre-set to the angle of drift. With an automatic arrangement there might be some tendency for the swing of the old Bleriots to repeat itself, unless the centring device were a good deal more powerful, and if that were the case, it would also require more force to trail the wheels during a cross-wind landing; this might cause a tendency to overturn.

There is, of course, a world of difference between the old Bleriot castering front wheels and those of a modern tricycle undercarriage, and information from America indicates that development is heading that way. Experimental contracts have been awarded to Fairchilds, who have tested castering gear on a PT-19 trainer; to Goodyears, who have installed their gear on a Piper J-3; and the Firestone tricycle gear, which is being put on an Ercoupe, and is just about to start its tests. In addition, the C.A.A. programme has been extended to a twin-engined Beech, which is being fitted with castering gear by All-American Aviation.

It will thus be seen that America is taking the castering undercarriage very seriously, and it would ill behove this country to drop behind in a development, the recent application of which was initiated here.

Abolishing the Undercarriage

DURING his lecture on naval aircraft at the recent R.Ae.S. all-day discussion, Mr. W. S. Farren hinted at the possibility of doing away with the undercarriage altogether on carrier-borne aircraft. The carrier lends itself, far better than any airfield, to this development, having already a vast supply of power in its engines, and being a very mobile "turntable runway."

The idea is a fascinating one, and the advantages of saving in weight and drag are obvious. While we were still using airscrews, the problem was almost impossible of solution, but with the advent of jet propulsion one of the great obstacles has been removed, and one can visualize naval aircraft being produced which will be superior in performance to their land-based counterparts. The weight saved by abolishing the undercarriage will go quite a long way towards making up for the greater fuel consumption of the jet engine.

It would be reverting, in modernized form, of course, to the earlier beginnings if it should be found that landplanes make use of the Bleriot idea of castering wheels, while naval aircraft adopt the original Wright Brothers' system of assisted take-off and wheelless landings. It would not be in the least surprising, for aviation history has many examples of ideas being propounded in the early days and abandoned later, only to be taken up again and made successful.

Strong Words

ELSEWHERE in this issue we publish a summary of a statement issued by the Central Board of the British Air Line Pilots' Association as a result of consideration by the Air Safety and Technical Committee of that association of two recent reports on air accidents.

In both cases the reports passed adverse comments on the ability of the pilots, and the B.A.L.P.A. statement endeavours to prove that other causes may have been responsible. In the case of the Speke accident, it is held that the official report fails to put the blame on the party mainly responsible: Airfield Control. Of the York crash at Yundum it is alleged that the official report did not sufficiently take into account the fact that the pilot turned through 117 deg between leaving the runway and the point of the crash. It is argued that if all four engines had been running at full power, no pilot, even if he lost control, could have turned so sharply at the weight at which the machine took off, and that there is a strong suspicion that the outer port engine was not giving full power.

The desire of the British Air Line Pilots' Association to clear the reputation of two of its members is understandable, and there is no gainsaying the fact that past aviation history has had too many examples of putting down accidents to "pilot's errors." At the same time, it should be realized that the Accidents Investigation Branch usually has a very difficult task, especially when an aircraft is completely destroyed and there are no reliable eye-witnesses. It would appear to be highly desirable that, in every investigation, the views of pilots with experience of the aircraft type involved should be very fully ascertained before a report is issued, and that if they disagree, the fact should be stated.

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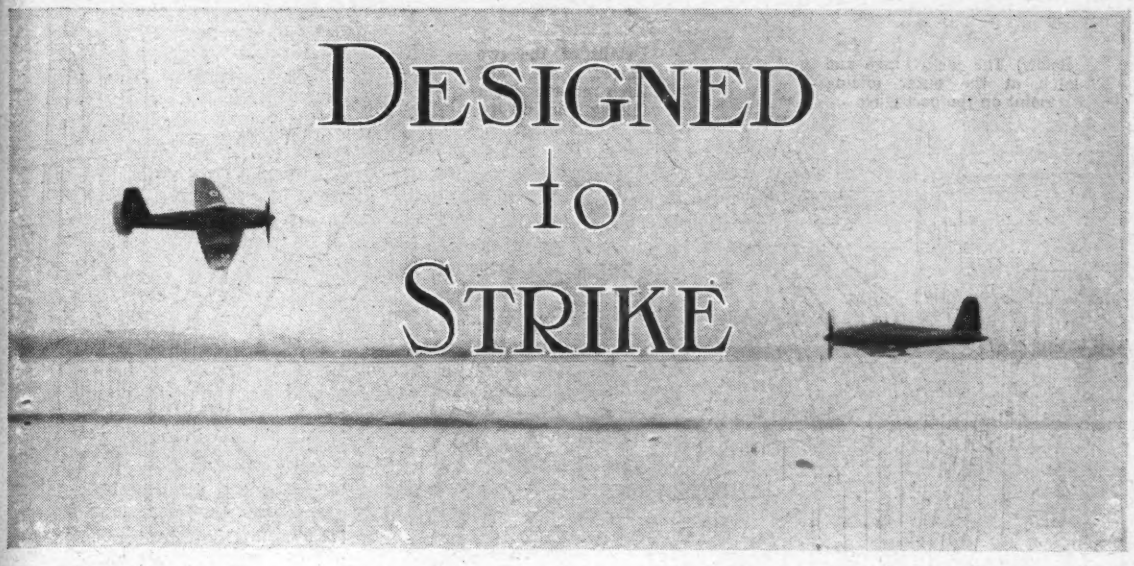
SWITZERLAND'S MAIN AIRPORT: Dübendorf Airport, at Zurich, takes the bulk of air traffic through Switzerland, with direct connections to more than twenty European cities. Kloten, the intended site for the main airport for Zurich, is nearly completed and will open on October 1st. Standing in front of the terminal building is Hunting's Dove, and on the right is the D.D.L. Dakota *Leif Viking*.



DESIGNED to STRIKE

S.28/43: Features of Blackburn's New Dive-Bomber/Torpedo Aircraft Discussed

A FOREWORD regarding the origin and purpose of the Blackburn S.28/43 will serve best to introduce this new Naval design, for which the name Firecrest has been suggested but not so far adopted. In addition to its official specification number it is also referred to by its S.B.A.C. designation YA.1 and sometimes by Blackburn's design number B.48.

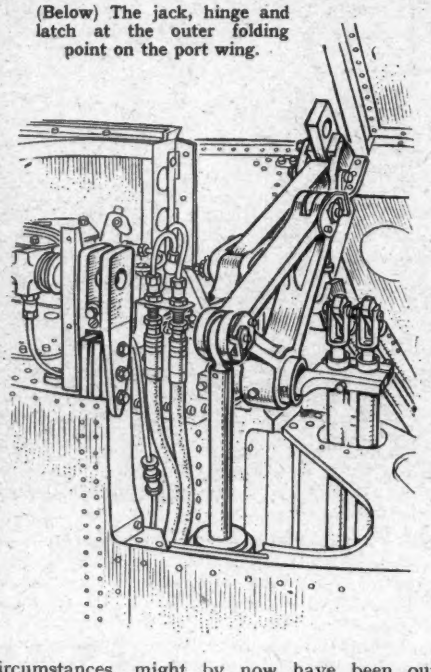
When the project design office started work in October, 1943, on this first Blackburn aircraft to be designed for Naval strike duties (for it will be remembered that the Firebrand was designed as a deck-landing fighter and was later modified for torpedo-carrying duties, a change-over which presented the design staff with many knotty problems) several primary requirements were borne in mind. Among these were an excellent forward view coupled with good low-speed control for landing on a carrier, a simple power folding system for the wings, and a high-speed, laminar-flow wing section. All these features and many more have been realized on the S.28/43, and almost the only important modification subsequently made to the first basic design is the increase in size of fin and rudder necessitated by the decision to produce the Centaurus power unit with a five-blade airscrew instead of a "torqueless" contra-rotating one. For carrier work, complete control of swing must be available, and in the case of the Centaurus this is specially important in that the L.H. rotation tends to produce a swing "islandwards."

Three Prototypes

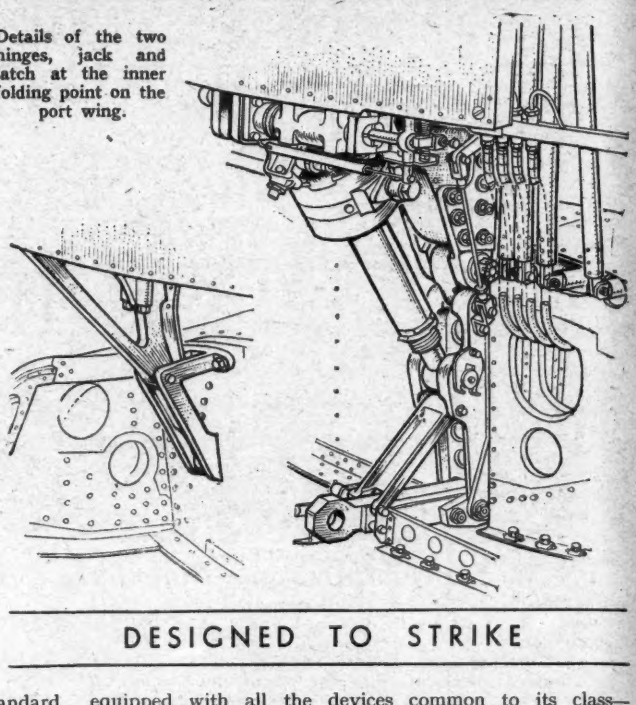
The S.28/43 first flew just before Easter, but, of course, had the war continued, it could have been ready more than a year sooner. Three only are now ordered for development, and to lead up to later Naval designs now beginning to take shape. The second and third are well on their way to completion, with engines installed. No production order is expected for this design, which, however, in different

The first S.28/43 was completed shortly before Easter and is here seen in the late snow at Brough airfield.

(Below) The jack, hinge and latch at the outer folding point on the port wing.



Details of the two hinges, jack and latch at the inner folding point on the port wing.



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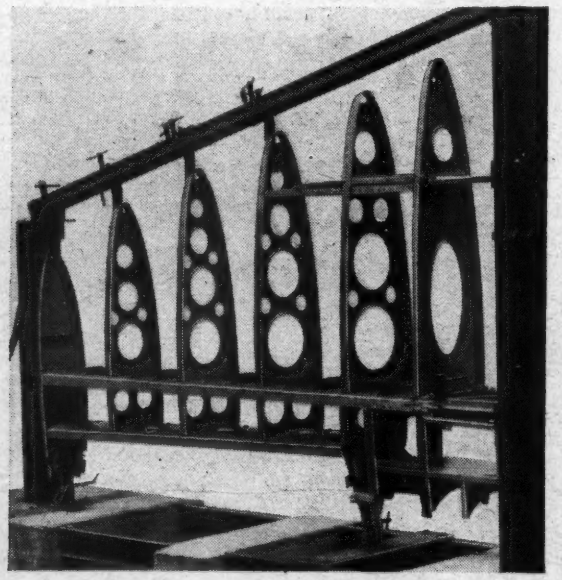
circumstances, might by now have been our standard carrier-borne strike aircraft.

The particular requirements mentioned above necessitate several changes in layout by comparison with the Firebrand. The pilot sits well forward over the wing spar and somewhat higher in the deep fuselage. The fuel tank, which previously occupied the present cockpit bay, is replaced by two bag tanks in the wings and a small one behind and below the pilot.

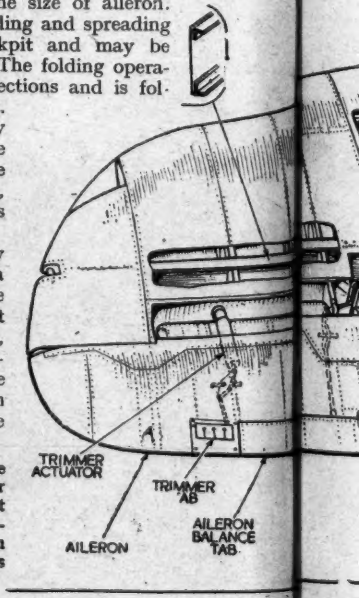
A brief description of the S.28/43 was given in our issue of April 17th, but, before describing the aircraft in more detail, the general layout may again be mentioned. It is a single-seat monoplane with low inverted gull wing. It is equipped with all the devices common to its class—hydraulically damped arrester gear, large four-section slotted flaps, dive brakes, etc. The engine is a Bristol Centaurus 59 in power plant "A" installation. The machine is a lineal descendant of the Firebrand, and the mixed type of fuselage construction is similar, but, in fact, the only components common to both types—and to some other aircraft as well—are the cockpit enclosure and tailwheel.

Undoubtedly the main interest of the airframe structure lies in the wing. This is made up of a centre-section and on each side two outer portions. Terminology tends to become confusing, but outer plane outer and outer plane inner sections are referred to, or, more colloquially, the folding portions are known as the "centre cuts" and the outer sections. The position of the outer folding point is governed by the size of aileron. Hydraulic-powered wing folding and spreading is controlled from the cockpit and may be carried out while taxying. The folding operation starts with the outer sections and is followed by the centre cuts. The system is protected by the usual cutouts, a sequence valve prevents folding if the flaps are down and, of course, no manual aid nor jury struts or the like are needed.

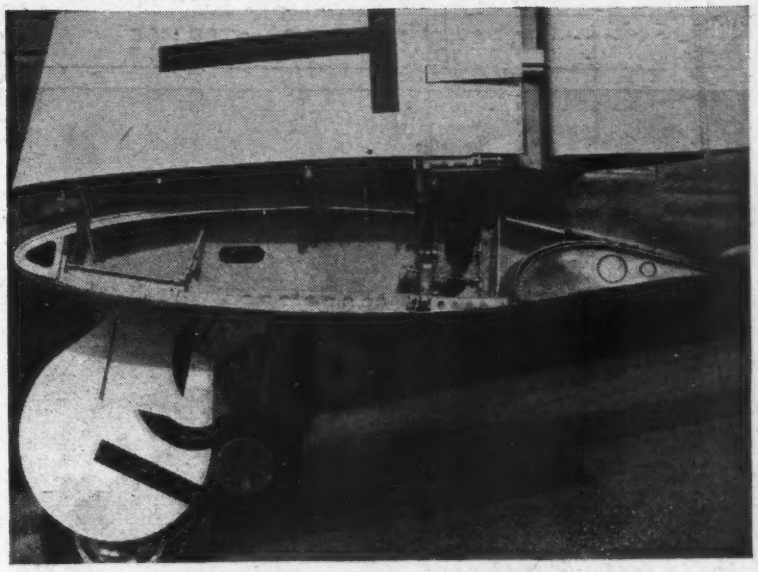
Unless it is most carefully designed, the weight of a double folding wing is liable to become very high, due not only to the hinge fittings, bolts and jacks, but to associated redundant structure used only during the action of folding. Consequently, the



An outer wing outer section in its jig. The single spar and inter-rib reinforcement at the front hinge point may be seen.



Port mainplane and centre section showing details of spar construction flap arrangement and the position of all controls. The layout of the main and filtered engine air intakes is also indicated.



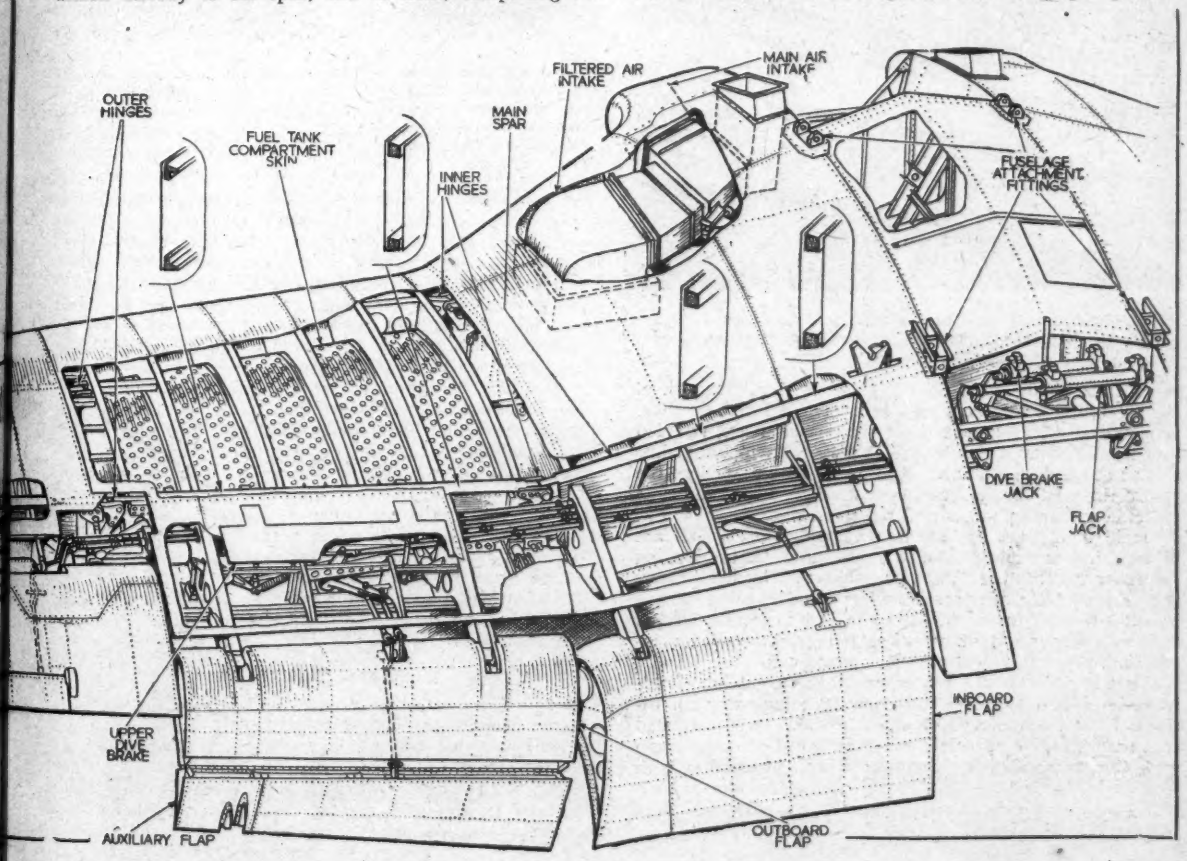
The inner folding point of the port wing showing the simplicity of the hinges and latch. (Details in drawing opposite.)

S.28/43 outer wing was built round a single spar, was designed to fold vertically, and there are only three attachment points at each of the joints.

Unlike the outer portions, the wing centre-section has two spars and extends one rib beyond the undercarriage attachment points. A centre-section front spar is structurally desirable for several reasons, among which are the need to bridge the wells for the landing wheels in the root portions and to give anchorage for the leg attachment fittings. The one centre-section rib outboard of the undercarriage fittings on each side carries bomb rack fittings which can be loaded easily when the wings are folded. Provision for carriage of a torpedo, at its release angle, was made in the original design, and by comparison with that of the Firebrand the S.28/43 centre-section has been much simplified.

Outboard of the first break the wing is of laminar-flow section and therefore has its thickest point towards the trailing edge (at about 60 per cent chord). This suits the single-spar layout well, for torsionally stiff structures can be built around and forward of the spar, and at the same time structural members do not tend to interfere with the large cavities required in the wings to contain the fuel tanks. For simplicity and lightness the three-point attachment is also good. A large rear hinge, latch pin and fitting attach directly to the spar, and in front, completing the triangle, there is a second smaller hinge. These comparatively simple joint fittings and the ribs extending in one piece forward of the single main spar—thus eliminating numerous small brackets and fittings which are usually required to attach nose and centre rib sections to the front spar—are to a great extent responsible for the commendably low structural weight of the wing. Location and inter-rib stiffening in the centre cuts are provided by the walls of the fuel tank cavities.

Ribs for the outer wing sections are simple pressed



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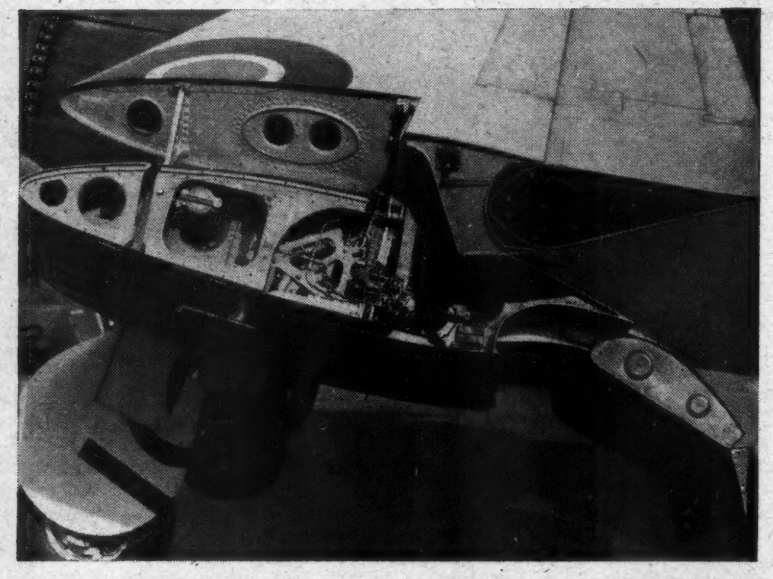
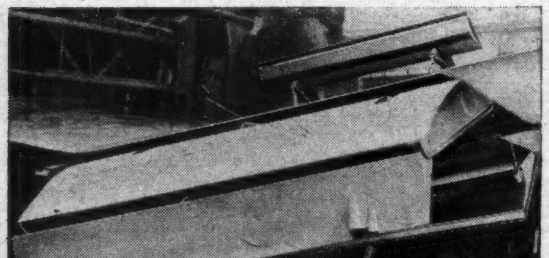


Folding commences with the outboard section. Here the port wing tip is folded and this is followed by the centre cut. The outboard flap section and its auxiliary flap are shown fully extended. Hinge details are given on page 488.



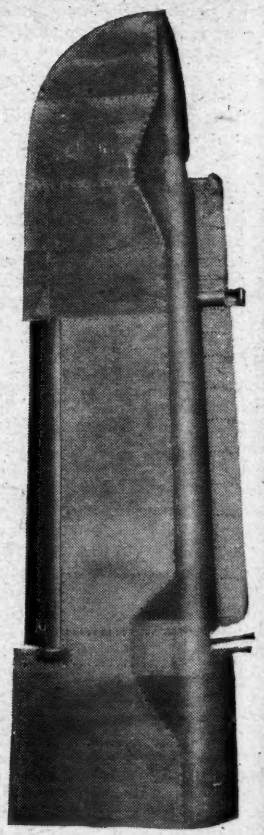
The inverted gull form of the wing is also shown in this photograph of the outboard flaps, auxiliary flaps and dive brakes in extended position.

members with flanged lightening holes. A photograph of the structure is given on page 488. Those for the centre-section have booms and plate webs which are doubled and locally stiffened below the fuselage attachment points and at the first wing joint. Hydraulics are grouped on the centre rib, and the centre-section structure has a complete top skin extending across under the fuselage.

Single main spar has square-section booms, which are relieved by machining down to angle section as the loading decreases towards the wing tips. Tharra "buried" rivets were adopted for construction after some 2,000 tests had been made with them. A test rivet in its specially drilled cavity is illustrated above after being sectioned for inspection.

What is probably the lowest structure weight for a folding-wing Naval aircraft, 29.56 per cent including all fittings, has been achieved on the S.28/43. It is estimated that some 1,000 lb of weight has been saved by comparison with the more orthodox two-spar wing construction with rearward wing folding—and, incidentally, the new aircraft total structure weight of about 4,520 lb is 1,400 lb less than than of the Firebrand.

A Tharra rivet sectioned for inspection. Many tests with these rivets have been made by the Blackburn Company.



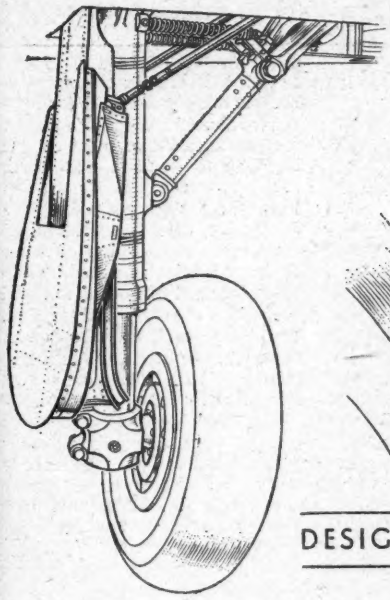
When seen as a separate unit the S.28/43 rudder appears exceptionally tall. The tab and the pressure balance paddle are clearly shown.

Of considerable interest on this aircraft are the main and auxiliary controls. The Blackburn company have done a great deal of experimental work with control surfaces and recently, in particular, with power-boosted controls which they have found most promising. A Firebrand V is at present flying with boosted ailerons, and the system when fully tested and perfected will be applied to an S.28/43, probably No. 3 for a start. The present ailerons are pressure-sealed and the paddle or break also carries the mass balance—adjustable in the case of the prototypes. The rudder and elevators are also of the pressure-sealed type but have horn balances in addition. The tall rudder with its pressure-seal paddle is illustrated above.

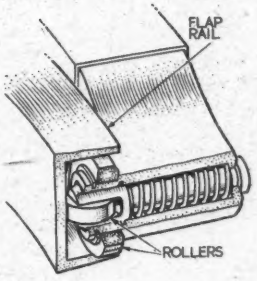
The ailerons incorporate balance tabs which are operated through the action of a torsion-bar system. When the load applied is sufficient to cause deflection of the bar, a relative movement of the balance tab in relation to the aileron takes place. The port aileron carries, as a refinement, a small spring-strip trimmer with electric actuator controllable from the cockpit. This is a satisfactory and simple form of trimmer for the aircraft, and the actuating mechanism forms part of the aileron mass balance.

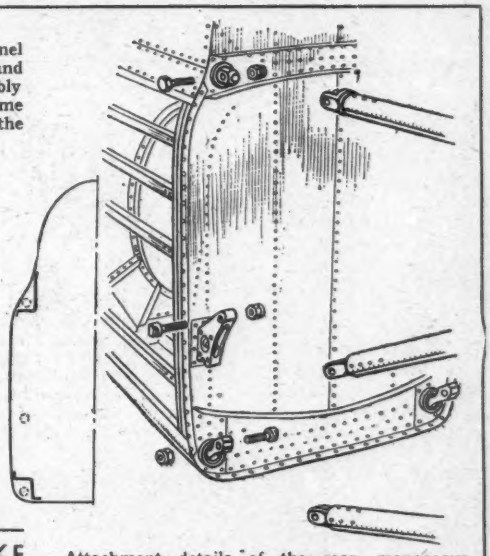
The Flaps

High-lift slotted flaps are fitted, and these are in four sections, two on each side. The outer flaps carry auxiliary flap surfaces which operate automatically. Two views of the outer and auxiliary flaps appear above. The purpose of the auxiliary flaps is to increase the lift coefficient and to give still greater drag, thus increasing the nose-down attitude on the approach. It is simpler to



(Below) Detail of the channel rail carried by the flaps and the fixed roller assembly attached to the airframe proper which guides the channel.





Attachment details of the rear monocoque section of the fuselage to the tubular members of the main portion.

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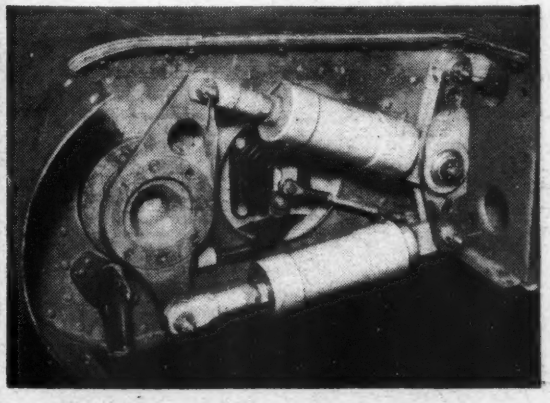
The port landing wheel and oleo-pneumatic shock-absorbing leg. The wheel fairing, its strut and the channel guide in which its rollers move are indicated.

arrange for, say, 35 deg of main flap movement plus 35 deg of auxiliary flap movement than to obtain the same effect with some 45 deg movement on a single main flap. It is understood that there is very little change of trim when flaps are extended.

To ensure that the movements of the flaps are synchronized, all four sections are operated simultaneously through tubular rods and levers by a single jack mounted on the back of the main centre-section spar, and the guide rails for the rearward flap movement are a part of the flap structure, the roller assemblies being in this case attached to the main airframe structure. The use of this form of flap has improved the forward view for the approach by about 1½ deg, and the overall lift coefficient is between 2.2 and 2.3.

A pair of dive brakes are fitted to each wing, one on the upper and one on the lower surface. They are located just ahead of the outer flaps in the centre cut, and when not in use they lie flush in recesses. By comparison with earlier Blackburn designs, in which dive brakes were introduced after the main design had been completed, the anchorage is simpler and lighter and the position close to the main spar is regarded as an improvement.



Spring units for the rudder tab. Between them the Desynn transmitter can be seen.

The brakes are operated by a single hydraulic jack on the centre-section spar, near the flap jack, to ensure simultaneous operation, and the movement of the four separate units is synchronized by the use of adjustable links in the lever and rod system. In operation the dive brakes do not cause any appreciable change in trim.

It is not intended to describe the fuselage construction in detail. Blackburn practice is followed in that the fuselage is made in two portions, the rear part being monocoque and the forward portion of tubular structure. The forward portion has longitudinal side-members of extruded channel section, and the unit has detachable panels extending from the fireproof bulkhead to the rear end of the equipment compartment behind the cockpit.

The tail surfaces have the familiar and characteristic Blackburn appearance with tall, angular fin and rudder and elevators set behind the vertical surfaces. Both rudder and elevators have large horn balances and, like the ailerons, the elevators have a torsion-bar-operated balance tab which is placed on the port side and corresponds with the trimmer tab on the starboard side. In the rod-operating system for the rudder are two spring links through which is controlled the rudder-balance tab situated below the trimming tab (see illustration). All three trimmers are electrically operated, and their position-indicators are grouped together on a panel on the port side of the cockpit.

Undercarriage Details

There are several points of interest in the design of the undercarriage. The units, which comprise a folding side stay and a short oleo-pneumatic shock-absorber strut fitted with a stub axle, fold inwards carrying their fairings with them. These fairings are supported by rollers which engage in two rails attached to the undercarriage leg, and they are linked to the airframe in such a manner that, as the wheel folds, they move down the leg until they coincide with the opening of the wheel well, and, on completion of wheel retraction, fit flush into the lower wing surface. Apart from the ingenious nature of this system, the absence of hinged panels on the lower wing surface to close the wheel wells makes the operation of attaching the torpedo much simpler.

The retraction of the wheels and their short legs is extremely rapid, taking approximately 1½ seconds. The

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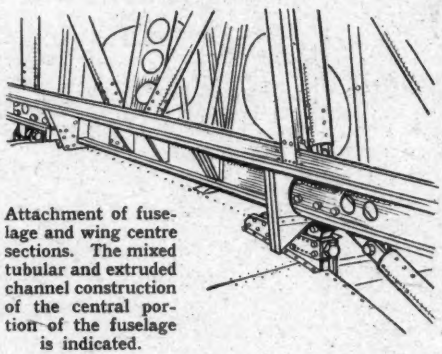
DESIGNED TO STRIKE

advantage of this, particularly on overshoots from deck landings, is obvious. There is no change of trim on retracting or lowering the landing gear.

Access to the grouped hydraulics on the main centre-section rib is gained through the port-side wheel well. The main fuel filter is also located in this well.

Firebrand pilots will appreciate the nose-down attitude and good view of the S.28/43 on the approach and will no doubt find the difference in attitude pronounced. When taxying, that is, with tail down, the line of sight from eye level along the engine cowling is approximately horizontal.



Attachment of fuselage and wing centre sections. The mixed tubular and extruded channel construction of the central portion of the fuselage is indicated.

The cockpit layout is good, and grouping of controls in the semi-standardized Naval layout is practical. The pilot's seat position is also arranged for vertical adjustment on the ground. Two attachment brackets behind the seat have three holes each which give three alternative height positions.

Bristol Power Plant

The Bristol Centaurus 59 engine is bolted to a mounting ring, carried by a tubular structure upon which it is flexibly mounted. The tubular structure has a four-point attachment to the airframe. From below, the auxiliary gearbox and fireproof bulkhead, both airframe components, are very accessible. Take-off power with water-methanol injection is 2,825 h.p., and the maximum rating in M.S. gear is 2,840 h.p.

Twin air intakes, one in each centre-section leading edge, feed the supercharger. The layout may be examined in the main drawing of the wing and centre-section. The main intakes are forward-facing and are protected with ice guards; filtered intakes, drawing air from the under surface of the wing, may be brought into use with the aid of shutters operated by electric actuators. A mechanical control from the cockpit operates shutters in the portions of the air duct enclosed in the engine cowling to provide hot air if required.

Engine cooling, assisted by a fan mounted on the spinner back-plate, is controlled by gills positioned on each side of the power plant and operated by an electric actuator mounted on the fireproof bulkhead. The cowling is made up of hinged panels secured by quick-release toggle fasteners.

Temporary Oil Cooler

There are some points of interest concerning the oil and oil-cooling systems. The tank is a power plant component located below the top rear fixed panel of the cowling. The cooler is placed below the pilot's cockpit, and at present it has an air intake scoop on the lower surface of the wing centre-section. After passing through the cooler, the air is led to the port side of the fuselage and exhausted at a point just aft of the gills. It is thought that, following development, the scoop for oil-cooling air may be considerably reduced in size, or even eliminated, the airstream being in this case drawn through the cooler as a result of the placing of the outlet in an area of low pressure. The oil tank itself is of special design providing for negative-g conditions. An anti-surge valve and by-pass valves for cold starting are incorporated in the system, and the tank is provided with a socket for an immersion heater.

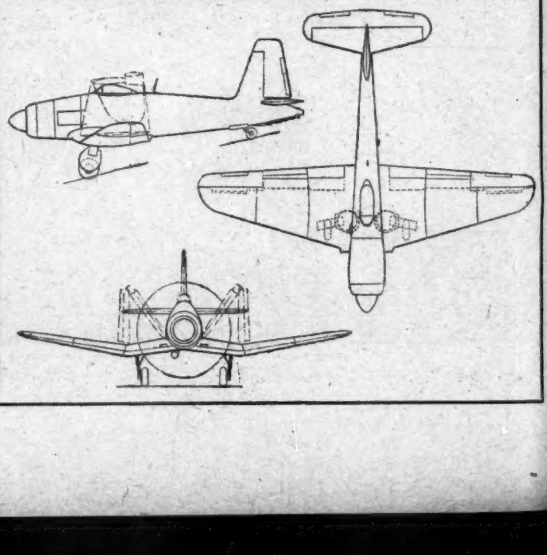
To facilitate refuelling with wings either folded or extended, bifurcated filler necks have been designed. However, it has since been found that a single 45 deg filler can be made to serve equally well. The provision of a perforated skin for the wing-tank compartments is called for in the original specification because wing fuel tanks are apt to sweat. In addition to the two wing tanks, each of which holds 92 gallons, and the 52-gallon fuselage tank, the fuel system provides for a 10-gallon methanol tank and for the attachment of two outboard drop-tanks of 45 or 90 gallons capacity and/or a central drop tank of 100 gallons capacity, the drop-tanks being, of course, interchangeable with armament.

The S.28/43 carries no guns, but provision was originally made to carry two 0.5-inch guns in the wings just inboard of the first folding point. In keeping with the present trend for this type of aircraft, two additional guns up to 35 mm calibre, could, if required, be hung below the wings. If additional guns were carried, they would be in place of the two 500lb bombs which are specified in addition to the torpedo. Provision has been made for the carriage of R.P.s under the wing centre cut.

Early tests—some dozen hours have been flown to date—are proceeding satisfactorily. It is much too early to give details of performance, but the S.28/43 will probably be at least 15 knots faster than the Firebrand. Approach characteristics, cockpit layout, electric trimmers and rubber-mounted power unit, have all been mentioned as noticeable improvements. The first aircraft will probably continue to be engaged on manufacturers' trials, and the second and third, one at least of which will be fitted with power-boosted controls, will go to Boscombe and also be used for deck-landing trials.

BLACKBURN S.28/43
2,840 h.p. BRISTOL CENTAURUS 59
(PRELIMINARY DATA)

Span	44ft 11¼in
Length	39ft 3¼in
Total wing area	361.5 sq ft
Centre plane anhedral	6 deg 35 min
Sweep back at leading edge	15 deg 47 min
Aerofoil section at fuselage	N.A.C.A. 43017 (Mod)
Outer plane dihedral	9 deg
Sweep back at leading edge	15 deg 42 min
Aerofoil section at root	N.A.C.A. 66, 2—(25), 17
Aerofoil section at tip	N.A.C.A. 64, 2—(35), 15
Structure weight	4,520 lb
Normal all-up weight	15,280 lb
Fuel capacity :	
Port and starboard wing tanks each	92 gal
Fuselage tank	52 gal
Port and starboard drop tanks each	45 or 90 gal
Centre drop tank	100 gal



MANX AIR RACES AND RALLY

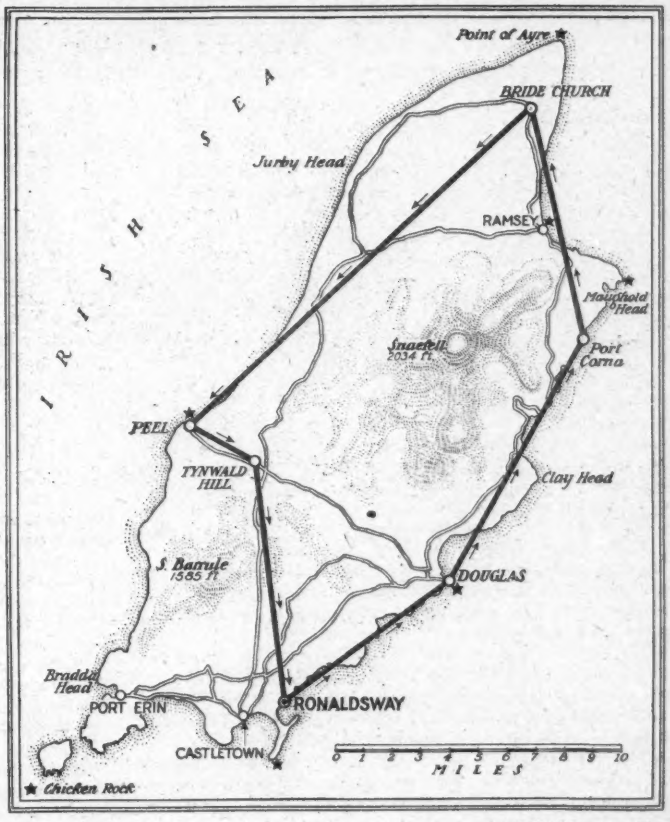
Fifth Annual Competitions for the Olley and Air Derby Challenge Trophies

THE first post-war Isle of Man air races were held over the Whitsun week-end, and our map shows the course flown by the competitors. The races, the fifth in the series which started in 1936 but were interrupted for seven years by the war, were held under the competition rules of the Royal Aero Club and the regulations of the F.A.I.

As in previous years, the races were each over three laps of the Island, with turning points at Port Carna (on the north-east coast, near Maughold Head), Bride Church, Peel Castle and Tynwald Hill. Each lap of the course was 53.25 miles long and the starting and finishing point was Ronaldsway Airport. It is regrettable that the air race from London to the Isle of Man, which was so popular before the war, could not be included this year, but it was felt that the present shortage of light aircraft and the considerable difficulties involved in organizing such an event at the present time made it impracticable. However, the London to Isle of Man race was replaced by an arrival competition, with prizes for the aircraft from anywhere in Great Britain or the Irish Free State which touched down nearest to a sealed time. If conditions are favourable, it is hoped to reintroduce the London-Isle of Man race next year.

The organization of the races was once again conducted by W/C. R. H. Stocken, and Messrs. F. R. Rowarth and W. Dancy undertook the handicapping of aircraft according to estimated performance. Mr. J. M. Cubbon, who is a resident of the Isle of Man, again generously contributed £500 to be distributed as prize money.

The Tynwald Air Race was open to all types of aircraft, both British and foreign, fitted with engines of 120 h.p. and under, whilst the Manx Air Derby was for British and foreign aircraft of all types with engines exceeding a total of 120 h.p. In addition to the £30 first prize and £10 each for second and third prizes given to aircraft from Britain in the arrival competition, similar prizes were offered to visitors from the Continent.



The Course *"Flight" Copyright Map*

ENTRANTS AND AIRCRAFT

Entrant	Pilot	Events	Aircraft	Engine	Reg.
Marquess of Londonderry	T. W. T. McComb, O.B.E.	1, 2	Miles Gemini	2 Blackburn Cirrus Minor	G-AIHM
Nat Somers	John N. Somers	1, 3	Hornet Moth	Gipsy Major I	G-ADSK
W. H. Leadbetter	W. H. Leadbetter	1, 3	Auster	Lycoming	G-AJJA
Major T. Rose	Major T. Rose	1, 2	Miles Hawk	Gipsy VI	G-ADGP
Miss Betty John	G/C P. E. Meagher, D.S.O., D.F.C.	2	Miles Monarch	Gipsy Major	G-ASJU
W. R. Scott	W. R. Scott	3	D.H.94 Moth Minor	Gipsy Minor	G-AFOB
Miles Aircraft, Ltd.	Geo. H. Miles or Kenneth Waller	1, 2	Aerovan	2 Cirrus Major	G-AILF
Miles Aircraft, Ltd.	Hugh Kendall	1, 2	Gemini	2 Cirrus Minor	G-AISM
Miles Aircraft, Ltd.	Eric Esler	1, 2	Messenger	Cirrus Major	G-AILI
E. Wheatcroft	W/Cdr. A. McDowell	1, 3	Auster Autocrat	Cirrus Minor	G-AGXV
Field Aircraft Services, Ltd.	N. W. Fagg	2	Proctor IV	Gipsy Queen	G-AJMV
Field Aircraft Services, Ltd.	B. Hill	2	Proctor I	Gipsy Queen	G-AHMV
Wolverhampton Flying School	R. R. Paine	1, 2	Magister	Gipsy Major	G-AHNU
de Havilland Ltd.	Bruce Campbell	1, 2	T.K.2	Gipsy	G-ADNO
The Aeroplane	S/L. T. S. Wade, D.F.C., A.F.C.	1	Auster	Cirrus	G-AERO
G/C Bandit	G/C Bandit	2	Sparrow Hawk	Gipsy Major	G-ADGL
Norman Hayman	Norman Hayman	1, 2	Beechcraft	Wasp Junr.	G-AIHZ
G/C Edward Mole	G/C Edward Mole	1, 3	BIBI Be 550	Walter Mikron	G-AGSR
J. K. Seear	J. K. Seear	3	Hornet Moth	Gipsy Major I	G-ADKC
Rotax, Ltd.	W/Cdr. Skinner	1	Consul	2 Cheetahs	G-AIUV
U.S. Embassy	E. Satterthwaite	1	Harvard	Wright Whirlwind	292
Flight	W/C. M. Smith, D.F.C.	1	Rapide	2 Gipsy Six I	G-ADAE
S/L. Wykeham-Barnes	S/L. Wykeham-Barnes	1, 2	Proctor I	Gipsy Queen	Z365
E. F. Hales	E. F. Hales		Auster	Cirrus Minor II	G-AGXZ

(1) Arrival Competition. (2) Manx Air Derby. (3) Tynwald Races.

MANX AIR RACES AND RALLY (*Continued*)

By four p.m. last Saturday all the competitors in the arrival competition had touched-down at Ronaldsway except Leadbetter's Auster, which returned to Blackpool with engine trouble. The Essex Aero Vega Gull was scratched. Scott's Moth Minor was delayed at Speke but arrived later. After waiting at Speke to escort Scott's Minor over the Irish Sea it was touch and go whether the Rapide flown by *Flight* would arrive in time. However, it was the last aircraft to arrive, with 30 seconds to spare, and there was no need to drop the dinghy carried in case of emergency for the light aircraft.

The first aircraft to arrive was Hugh Kendall's Miles Gemini, which touched-down 1¾ minutes after three, winning the first prize. Second and third went to Hayman's Beechcraft and Esler's Messenger respectively. Late entrants not shown in the table on the previous page were Temple-Harris on a Proctor and Spencer on an Autocrat.

On Sunday morning a few competitors flew the course for Monday's race. Others examined the turning points from a coach. These were marked by a bell tent and an orange cone. The weather was fine and made the polish on the cowlings shine brilliantly.

Monday morning broke with damp cloud covering the island, but after breakfast bright patches began to show, and there was heavy cloud on Snaefell only. Refuelling, engine runs and more polishing occupied the time until lunch. After lunch we took the Rapide round the course and found much patchy low cloud over the Douglas-Jurby stretch. The turning points were almost obscured, but the weather slowly improved, and by the time the race started the Jurby-Peel Castle leg was clear and the sun shone brilliantly. However, we found the air from Tynwald Hill very rough and had to fasten our straps. It was also rough flying through the dog leg gap back to Ronaldsway; but the weather was improving.

Fine Racing on Whit Monday

The two races (for the Olley and Manx Derby Trophies) were flown simultaneously and on the same handicap basis. A goodly crowd was present.

First machine away at 2.15 was Spencer's Auster, 35 minutes ahead of the scratch man, Hayman, in the Beechcraft. The limit man was followed at short intervals by Hales on an Auster, Somers (Hornet Moth), McDowell (Autocrat), Scott (Moth Minor), and Mole (Bibi Be 550). The Bibi was the lowest-powered craft in the race, but it conceded 5½ minutes' start to the Auster. According to the programme Somers' Hornet was competing in the Tynwald Race, but after flying very well and fast, and crossing the line an easy first, the light aircraft was declared to be above the 120 h.p. limit, and so was placed third in the Derby. (The Gipsy Major engine is nominally rated at 118-122 h.p.). Somers' average speed was 116 m.p.h.

The Tynwald Race winner was thus McDowell in the Auster Autocrat; second was Spencer in the Auster, and third Mole in the Bibi. Before the race there had been much discussion about the speed the T.K.2 would achieve with the new high-compression Major Ten, and if Tommy Rose's Hawk Six would prove faster. Some considered the Beechcraft biplane with retractable wheels a dark horse; others speculated about the new secret cream Gemini with coarse-pitch airscrews, or whether the experience plus speed combination of Waller's Aerovan constituted a real danger to the others. The race developed into an exciting fight between the Hawk Six and the T.K.2, with Somers, Kendall, Waller, Temple-Harris all going well. Hayman made a great effort to make up his handicap and did well to finish sixth as fastest man, with a speed of 186 m.p.h.

Excitement Builds Up

At the end of the second lap Somers increased his lead, McDowell's Auster was still in second place, and Waller moved up to third. Esler's Messenger held next place to the Aerovan in the Manx Derby, with Kendall's Gemini and Temple-Harris's Proctor in close pursuit. Rose (Hawk Six) and Campbell (T.K.2) were catching up fast in eighth and ninth places.

Long before the winners were due, all eyes were on the hills to the north of the airport. Suddenly, flying very low, came Tommy Rose's yellow Hawk Six, to win at a very fast pace. His speed worked out at 181 m.p.h. Campbell (T.K.2) was only just behind, with a speed of 179 m.p.h. Somers in the Hornet Moth arrived third, Kendall's Gemini fourth, Temple-Harris's green Proctor fifth. The Beechcraft succeeded in beating the Aerovan near the finishing line. It was a very good race.

Lord Londonderry arrived by air to watch the performance of his blue Gemini, but it was unfortunate that the wheels failed to retract, as did also those of the other Gemini over part of the first lap.

All the competitors had very rough rides over the north and west legs of the Island course. Leadbetter in the Auster turned on his back and received a slight cut on the head. Scott (Moth Minor) finished at reduced speed, and several others were bruised, and Waller was aching after the Aerovan flight. Rose's engine momentarily cut on the last lap, owing to low fuel and the bumps. The breeze stiffened towards the end to make landings exciting for the ultra-light aircraft.

His Excellency the Lieutenant Governor, Air Vice-Marshal Bromet, attended the meeting and in the evening presented the prizes in the Palace ballroom at Douglas.

RESULTS

Manx Air Derby: 1, Maj. Tommy Rose (Hawk Six), 181 m.p.h.; 2, Bruce Campbell (T.K.2), 179 m.p.h.; 3, John N. Somers (Hornet Moth), 116 m.p.h.

Tynwald Air Race: 1, W/C. A. McDowell (Auster); 110.5 m.p.h.; 2, V. H. Spencer (Auster), 101 m.p.h.; 3, G/C. E. Mole (Bibi Be 550), 100.5 m.p.h.

NENE-POWERED GRUMMAN

IT was announced in Washington two days ago that the U.S. Navy's Grumman fighter, powered with a Rolls-Royce Nene, will fly this summer. The U.S. Navy has contracted for a number of Nenes, to be built by Pratt and Whitney.

B.O.A.C. CHIEF'S TOUR

LORD KNOLLYS, who is making a farewell tour of B.O.A.C. routes, accompanied by Air Cdre. Whitney Straight, arrived in Australia on Whit-Monday. They will go on to New Zealand. Lord Knollys leaves the chairmanship of B.O.A.C. to return to his business in the City on June 30th. This tour will bring his total of miles flown during his four years of service with the Corporation to nearly 200,000. Air Cdre. Whitney Straight joins B.O.A.C. as managing director and chief executive on July 1st.

ENGINE FAULT DETECTOR

A DEVICE has been developed in Sweden and is being installed on aircraft in use by A.B.A. and S.I.L.A. which, it is believed, will lessen the danger of fire at the engine in the air. The idea, as explained by Mr. A. Hansson, chief engineer of A.B.A., is based on the theory that a series of small symptoms, if detected, would indicate an approaching engine failure, as in cases of over-heating or damage to bearings or pistons, when small pieces of metal would be loosened and would join the oil flow to the pump. The fault detector, consisting of a small steel pin enclosed in a metal cartridge, is placed in the oil pump and connected with an electric battery. Metal particles following the flow of oil to the pump pass through the narrow passage between the pin and cartridge, making a contact between the two. The current is cut off and a warning bulb is lighted. Tests have indicated that it discovers most forms of engine trouble before the ordinary instruments show any reaction.

STAGE COACHES, 4 h.p.—3,380 h.p.: This old London to Oxford stage coach delivered the mail to a B.E.A. Viking aircraft at the inauguration of the new service to Geneva on May 19th. The first Viking proving flight to Switzerland was made on April 14th and 15th.

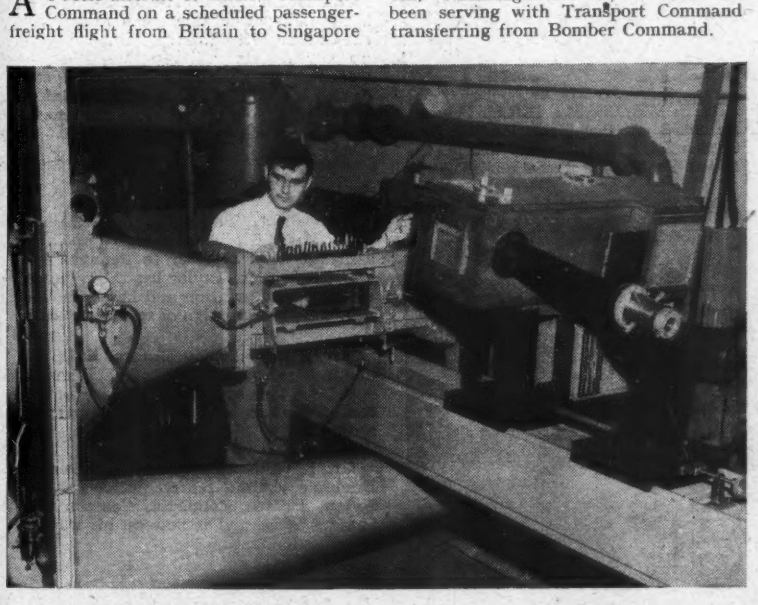
HERE AND THERE

Swiss Buy Vampires

THE Swiss Government have authorized the immediate purchase of 75 Vampire jet aircraft at an estimated cost of three million pounds. A further seven million pounds is to be expended on wireless apparatus and ammunition.

Ceylon-Singapore Record

A YORK aircraft of R.A.F. Transport Command on a scheduled passenger-freight flight from Britain to Singapore has broken the Transport Command record for the run from Negombo, Ceylon, to Changi, Singapore, by sixteen minutes. F/O. T. W. Good was captain of the York, which took 7 hr 9¼ min to complete the 1,843 statute miles at an average speed of 257 m.p.h. It was F/O. Good's second trip to Singapore and his first flight as captain. The York belongs to No. 242 Squadron based at Oakington, Cambridgeshire. F/O. Good has been serving with Transport Command transferring from Bomber Command.



FOR SPEEDS UP TO 2,500 m.p.h.: The North American Aviation Company's supersonic wind tunnel at Los Angeles, showing the 1.75in × 4.5in. working section and manometer connections. The Schlieren apparatus for viewing and recording shock-wave patterns can be seen on the right.

Australian Statistics

IT is revealed that 1946 was the busiest year in the history of Australian civil aviation. Regular Australian airlines carried 640,666 passengers, flying a total of 8,695,311 miles. The most spectacular increase on the 1945 figures was the amount of freight carried, which rose from 1,579,696 ton/miles in 1945 to 4,024,621 ton/miles last year.

Amsterdam-Dublin Service

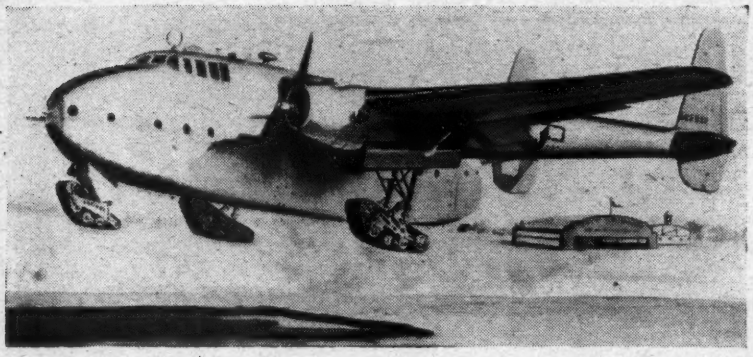
THE new air service linking Amsterdam, Manchester and Dublin was opened on May 20th by K.L.M., in conjunction with Aer Lingus. The service is to be operated four times weekly in each direction, providing a direct route to the Continent from Eire and the Midlands. K.L.M. will be renewing an old link with Manchester, for until 1939 it was a regular stop for the Dutch air service.

Overseas Expansion

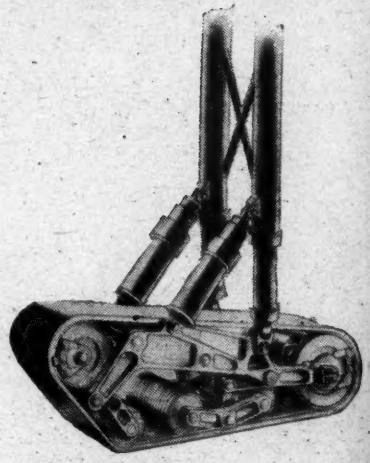
AN agreement for participation in a new manufacturing company in India is announced by Portsmouth Aviation, Ltd. A modern factory is to be built in India as soon as possible, and the company will produce and service aircraft besides manufacturing a wide range of light engineering products. Similar arrangements, state Portsmouth Aviation, Ltd., are being negotiated in Australia, Canada and Italy.

American Supersonic Tunnel

THE closed-circuit supersonic wind tunnel at the Los Angeles base of North American Aviation, Inc., was planned primarily for conducting tests of a fundamental nature on aerofoils, diffusers and projectiles so that experimental confirmation of supersonic flow theory could be obtained. The range of



ROLLING HOME !: As seen by an artist, a track-type undercarriage fitted to a Fairchild C.82. The "rollers" are designed to retract into the engine nacelles in the same manner as a conventional undercarriage. Known as a "beetle" undercarriage, similar types have been tried in France and developed by the Dowty concern in Britain.



HERE AND THERE

tunnel operation is said to be from 1.25 up to 3.25 Mach number, which is equivalent to conditions corresponding to sea level speeds of 950 to 2,500 m.p.h.

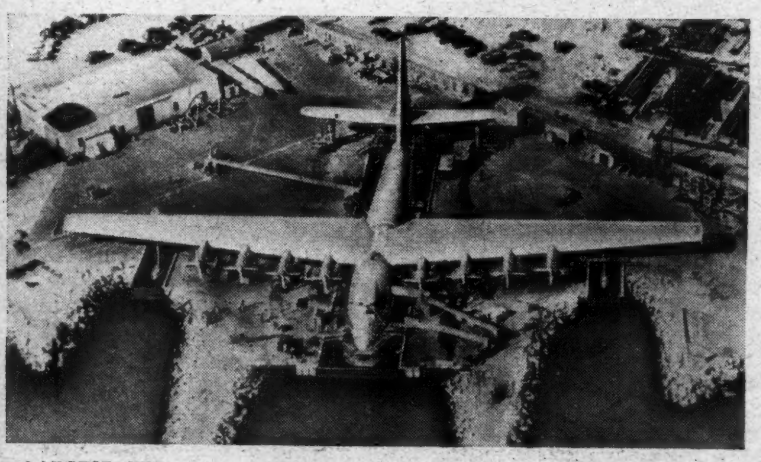
A unique feature of the tunnel is the incorporation of an air diffusing mechanism in the exhaust section, which is claimed to permit a higher air speed for a fixed initial air pressure than any other tunnel in America. The diffuser can be adjusted to allow the highest possible flow speed for any required pressure, whereas diffusers in other similar tunnels are not adjustable. This feature is estimated by the company to give the tunnel from 10 to 15 per cent greater efficiency.

Flight Postponed

G/C. GEOFFREY L. CHESHIRE, V.C., who was to have flown to British Columbia to found a new "Vade in Pacem" settlement there, has had to postpone his flight indefinitely owing to a breakdown in health. His doctors have ordered him six months' complete rest. G/C. Cheshire founded the "Vade in Pacem" settlements at Liss, Hants, and Gumley Hall, Leicester.

"Flight" photograph.

ROYAL WELCOME: H.R.H. Prince Bernhard of the Netherlands with Gerben Sonderman, Fokker test pilot, at the Ypenburg International Rally.



LARGEST YET: The world's largest aircraft, designed and built for Howard Hughes, in its graving dock at Terminal Island, Long Beach, California. After ground tests it is to undergo extensive water taxy tests before its first flight.

New Landing Gear?

THE adaptation of an old idea is to be installed in the American Fairchild C.82 aircraft. The landing gear is to consist of an arrangement of cylinders and rubber belt, similar to the tracks used on tanks, which it is believed will enable the aircraft to land on soft dirt, sand, mud and many other surfaces hitherto considered unsafe as landing strips. The illustration on this page shows an artist's impression of a Fairchild C.82 equipped with the track-type undercarriage.

Evasive Action?

THE Agricultural Research Council are using a helicopter in an effort to collect specimens of a small insect known as the bean aphis, more commonly called the "Black Dolphin," which is being blown across the English Channel and is breeding on the English coast in increasing numbers. The helicopter tows a circular net of fine mesh and makes runs at 1,000ft into the wind, scooping up any insects in its path. Research work on the "catches" is being conducted by Prof. A. C. Hardy, of Oxford University. We are informed that so far the bean aphis has evaded the net.

News in Brief

MR. P. J. TAYLOR, A.F.R.Ae.S., M.I.P.E., has been appointed assistant chief designer to Percival Aircraft, Ltd. Mr. Taylor has thirty years' experience of aviation and has been connected with the design of several aircraft.

* * *

Armstrong Siddeley Motors, Ltd., announce that Mr. W. T. Johnson, A.C.I.S., who has been secretary of the company since 1938, is now appointed a director.

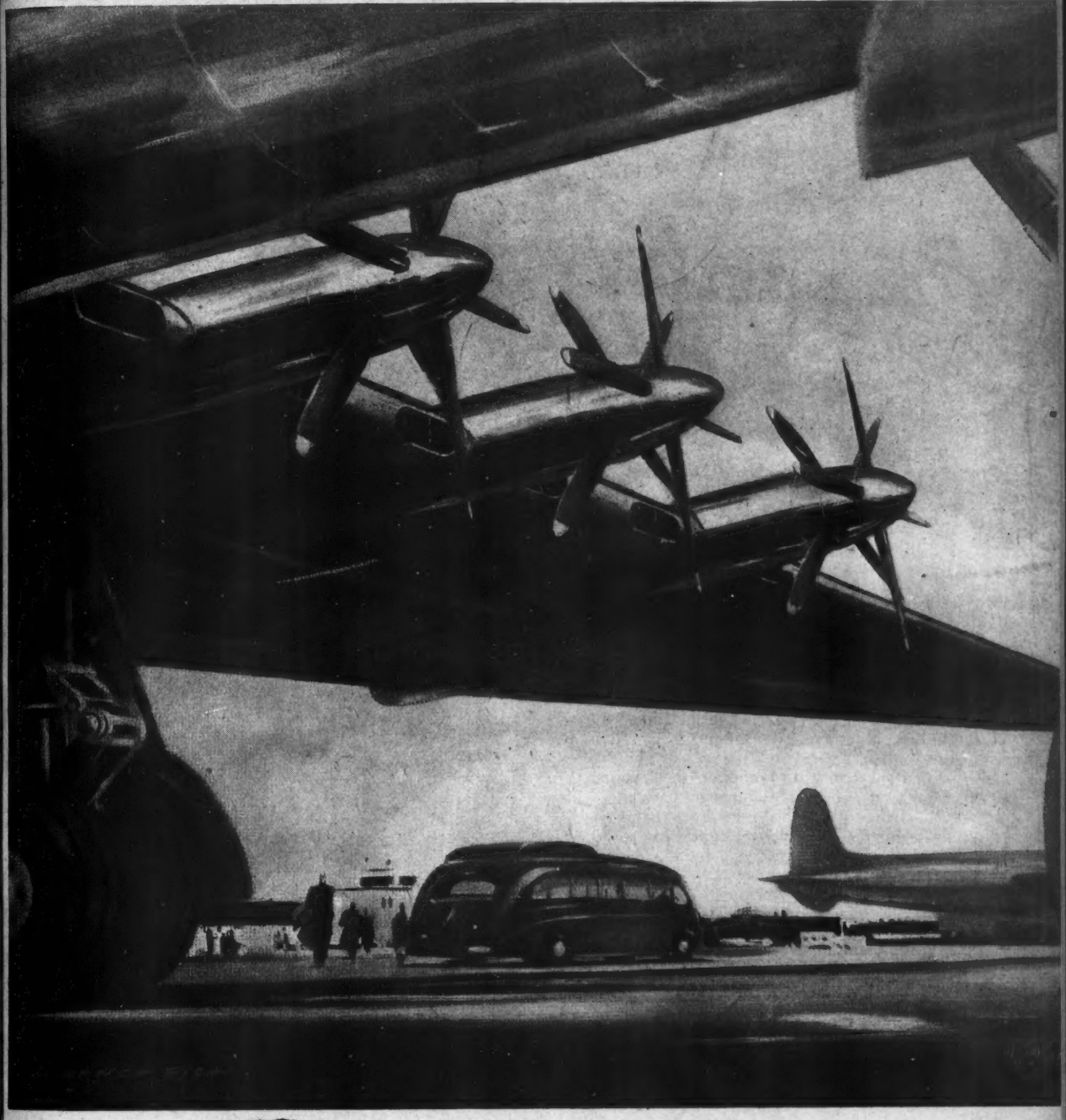
* * *

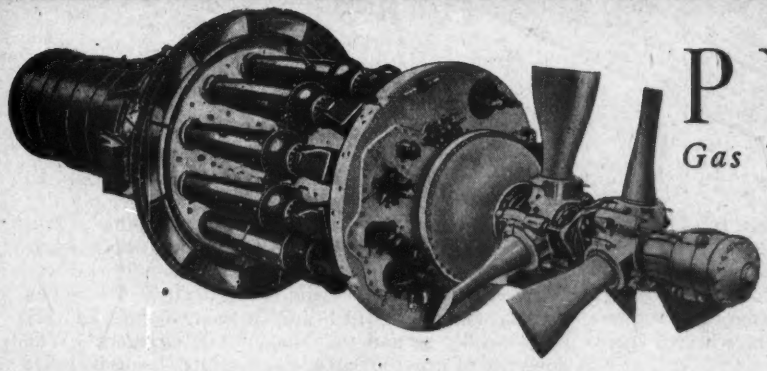
Mr. J. W. Norton has been appointed Dunlop's visiting representative for the Sudan, Eritrea, Ethiopia, Somalia and Saudi Arabia, and is now on his way to the Middle East.

* * *

G/C. G. E. Watt, A.F.C., arrived in New Zealand recently to take up the position of chief engineering officer to the R.N.Z.A.F. G/C. Watt was formerly one of the principal collaborators in the development of jet and gas turbine engines.

POWER FOR THE PLANES OF TO-MORRO





PYTHON

Gas Turbine Propeller Engine

ARMSTRONG SIDDELEY
MOTORS, PARKSIDE, COVENTRY

BRANCH OF HAWKER SIDDELEY AIRCRAFT COMPANY LIMIT

THE CONC

Structural Details of Cu
Light/Medium Feeder

IN accordance with our established practice of dealing with new type aircraft in three basic stages—preliminary appraisal, structural survey, and final analysis—we give here the second stage of Concordia progress, the initial appraisal having appeared in our issue of March 14th, 1946.

As may be seen from the illustrations, the Concordia is a purposeful, good-looking and obviously practical aircraft. It falls into the very useful 10/12-seater category, is equipped with, to borrow a phrase, every modern convenience, and for its designed field of duties should prove to be an eminently worthwhile machine.

Leonides engines have been designed by Alvis to combine with all accessories in a unit power plant which is anchored at four pick-up points on the forward face of the firewall, and it is claimed that a complete engine change is possible in no more than 40 minutes. In this connection it is worthy of note that the power plants are interchangeable. Although the new type Rotol three-blade airscrews are available with reverse-thrust braking if specifically required, the standard Concordia will not make use of this function.

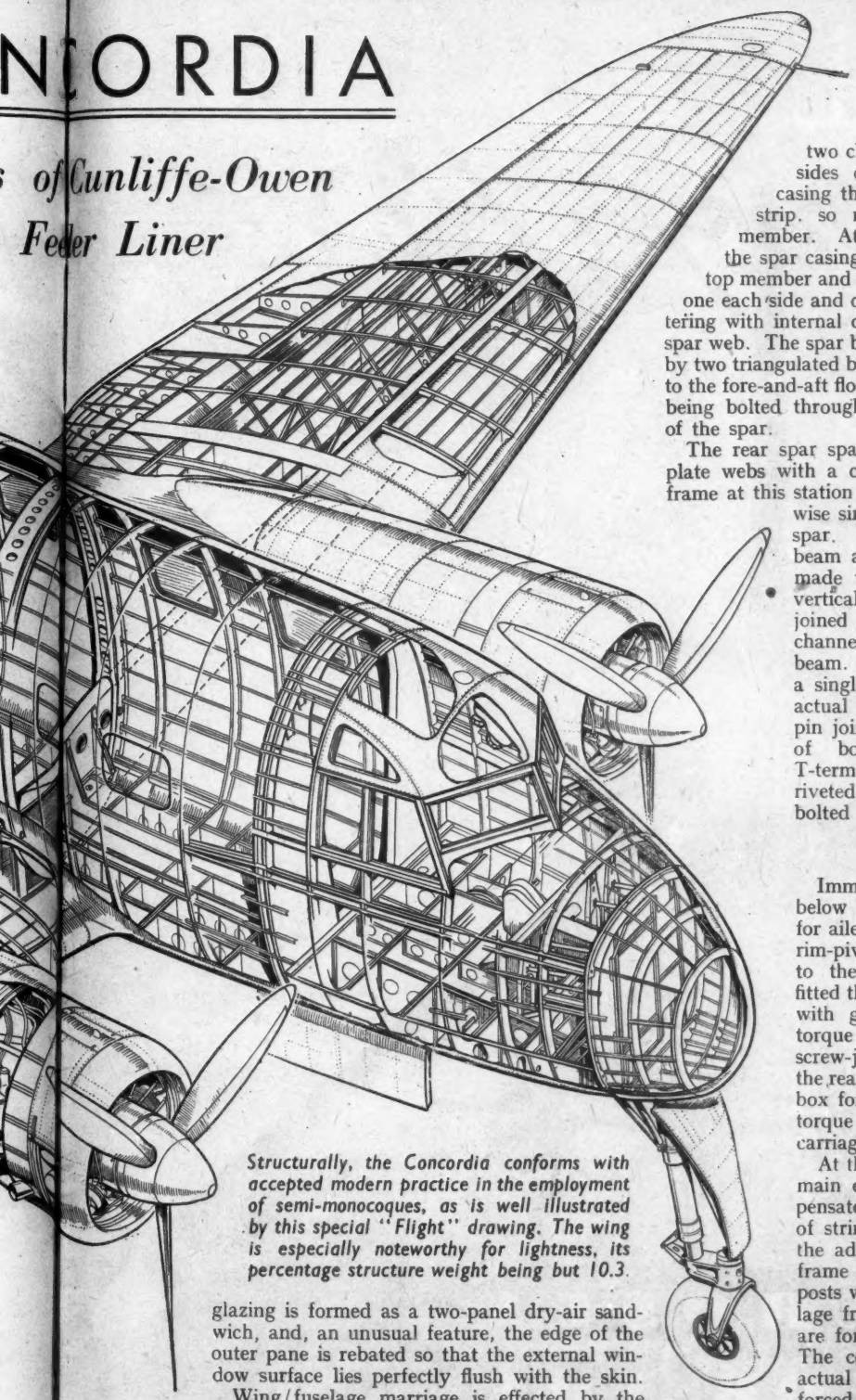
Single-strut Lockheed undercarriage legs are actuated electrically, and are fitted with Goodyear wheels, tyres and the new single-disc type hydraulic brakes. Undercarriage retraction is quite rapid—of the 8 sec. order—the main legs retracting forward and upward whilst the nose leg moves rearward and up, and, at the same time, rotates through 90 deg., so that the plane of the wheel is horizontal when stowed.

In conformity with the airframe as a whole, the fuselage is a simple and straightforward fabrication of light, pressed channel frames notched for the passage of bulb-angle section extruded stringers. At each stringer/frame intersection the frame flange is joggled to ride inside the stringer flange, these primary members being attached, together with the skin, by a single rivet. In the main trunk portion of the fuselage, stringer pitching is approximately 7in centre-to-centre, and this gradually decreases fore and aft accordingly as the fuselage tapers towards nose and tail.

Above and below the windows run extruded T-section stringer/longerons which are, in point of fact, of very little heavier section than the normal stringers. Windows are of generous area, the openings being bounded by built-up channel-section surrounds, the free flanges of which line up with those of the fuselage frames; the

NCORDIA

...s of Cunliffe-Owen Feeder Liner



Structurally, the Concordia conforms with accepted modern practice in the employment of semi-monocoques, as is well illustrated by this special "Flight" drawing. The wing is especially noteworthy for lightness, its percentage structure weight being but 10.3.

glazing is formed as a two-panel dry-air sandwich, and, an unusual feature, the edge of the outer pane is rebated so that the external window surface lies perfectly flush with the skin.

Wing/fuselage marriage is effected by the centre-section main spar piercing the fuselage in port and starboard halves where, joined on the centre line, it is enclosed by a boxed casing. The rear spar—a much lighter unit—does not enter the fuselage; the port and starboard sections are pin-jointed to a box-form spanning member, which is integral with the fuselage floor structure. The main spar box rises above the cabin floor line roughly 12in, and so divides the cabin into two compartments—although no bulkhead is fitted at this station—but the rear spar spanning member does not obtrude above the floor.

At the main spar station the fuselage frame is composed of two channel hoops which pick up to the sides of the spar casing. Above the casing the channels are joined by a cover-strip, so making the frame a box-section member. Attachment between the frame and the spar casing—which is formed with a channel top member and plate webs—is by three main bolts, one each side and one at the keel line, the bolts registering with internal distance pieces on each side of the spar web. The spar box is supported on its forward side by two triangulated built-up box brackets which pick up to the fore-and-aft floor beams, the head of each support being bolted through the case web to the top boom of the spar.

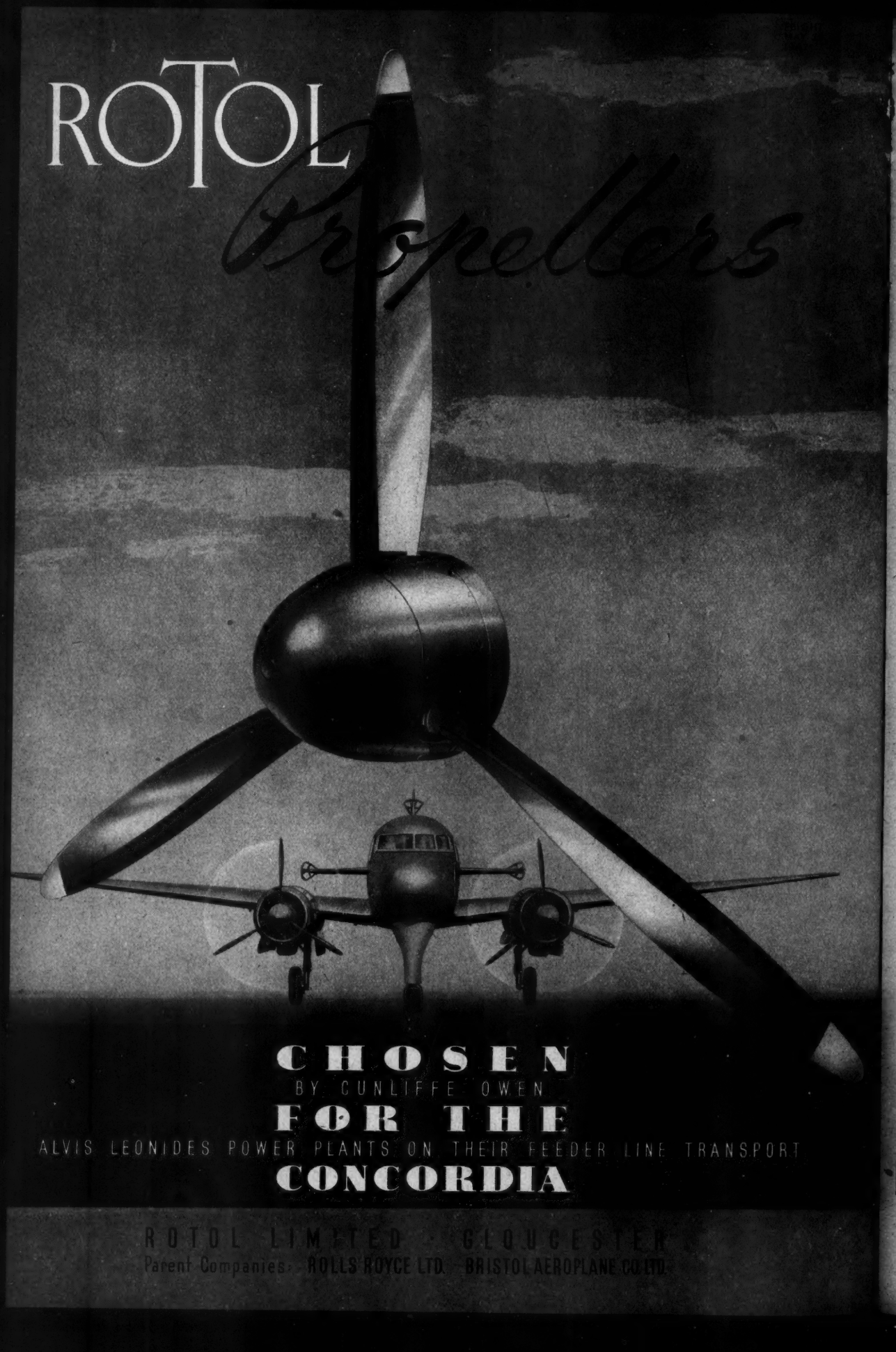
The rear spar spanning structure is a box-beam of plate webs with a channel top member, the fuselage frame at this station being a slightly lighter but otherwise similar unit to its fellow at the main spar. Attachment between the spanning beam and the halves of the rear spar is made with a massive channel strut set vertically in the fuselage spar frame, and joined by triangulated side plates to the channel top member of the spanning beam. Between the side plates registers a single lug-fitting on the spar end, the actual attachment being by means of a pin joint. Stringers pick up to the webs of both spar frames with forged T-terminals, the shank of the T being riveted to the stringer and the cross-head bolted to the frame web.

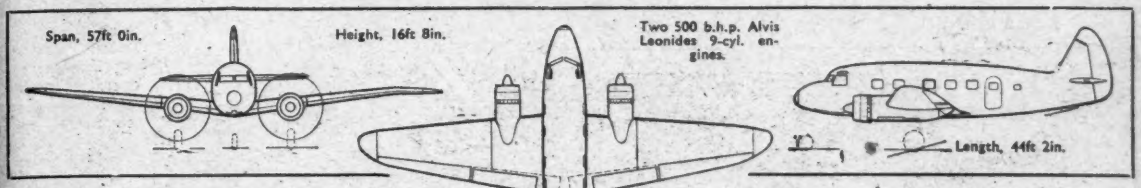
Control Linkage

Immediately behind the main spar just below floor level are the cable quadrants for aileron operation, the quadrants being rim-pivoted to push-pull tubes passing out to the wing. Behind the quadrants is fitted the undercarriage actuator, complete with gear box, the universally jointed torque tubes passing spanwise out to the screw-jacks fitted in each nacelle. Behind the rear spar is fitted the actuator and gear box for the flaps with universally jointed torque tubes carried out in the undercarriage manner.

At the rear of the fuselage to port is the main entry door, the cut-out being compensated by channel intercostals in place of stringers between the door frame and the adjacent fuselage frames. The door frame itself is formed with rolled channel posts which are, in effect, additional fuselage frames, and the lintel and threshold are formed by similar channel members. The corners are curved cut-outs of the actual skin plating, the edges being reinforced by angle strips.

Opposite the entry door, and very convenient for access, is a useful volume luggage compartment enclosed by stressed partitions, the forward wall being a corrugated light-alloy sheet of about 22 gauge, whilst the side and rear walls are of plain sheet stiffened with Z-section horizontal stabilizers; the door posts are rolled channels. Immediately rearward of the luggage hold is the toilet—a rather small compartment—lighted by windows in each side wall which are smaller versions


ROTOL
Propellers
CHOSEN
BY CUNLIFFE OWEN
FOR THE
ALVIS LEONIDES POWER PLANTS ON THEIR FEEDER LINE TRANSPORT
CONCORDIA
ROTOL LIMITED GLOUCESTER
Parent Companies: ROLLS ROYCE LTD. BRISTOL AEROPLANE CO. LTD.



THE CONCORDIA

of the cabin windows. In the tail cone of the fuselage, aft of the toilet, the front spar of the fin picks up to a reinforced channel-section frame, about 12in aft of which is a further built-up frame to which the tailplane leading-edge attachment is made. This frame is spanned by built-up box struts carrying the fairlead pulleys for control cables, and from this station to the extreme tail the fuselage roof is formed as a decking above which the tailplane is anchored.

Main attachment of the tailpane through conventional fork and lug fittings is made at a second frame, about 30in rearward, built up with three shallow channel pressings, two of which are reinforcing members on each face of the main channel web. A built-up box structure is supported at this station and carries the control cable quadrants for rudder and elevator actuation. The final frame, of diaphragm form, is raked forward and carries machined lug fittings to attach the complementary forks at the foot of the rear fin post.

Floor structure comprises transverse beams at each frame station and fore-and-aft intercostals, all these members being of pressed sheet with their top edges turned over in order to make, with an angle strip, a T-head for supporting the floor panels. In order to afford adequate headroom despite the downward curvature of the fuselage roof, an aisle about 15in wide is formed in the floor forward of the front spar at a level approximately 3in below the general floor line. The cockpit floor is supported on a grid framework of pressed channel beams and incorporates the nosewheel well. This is bounded by parallel beams which taper progressively in depth in their forward run. A Y-form fairing panel attached to the nosewheel itself is closed by conventional rectangular doors operated positively by the retraction and opening movement.

Dividing the cabin from the cockpit the pilot's bulkhead is stabilized with vertical and horizontal channel members, a contour member of similar section framing the horseshoe-profile doorway. In general structure the cockpit conforms to the fuselage norm but, in addition, incorporates heavy-gauge rolled top-hat section "longerons" about 6in below the side screens, these terminating at the bulkhead where they pick up a vee-blending of flanged angle members which die aft at the leading edge of the front windows in the cabin.

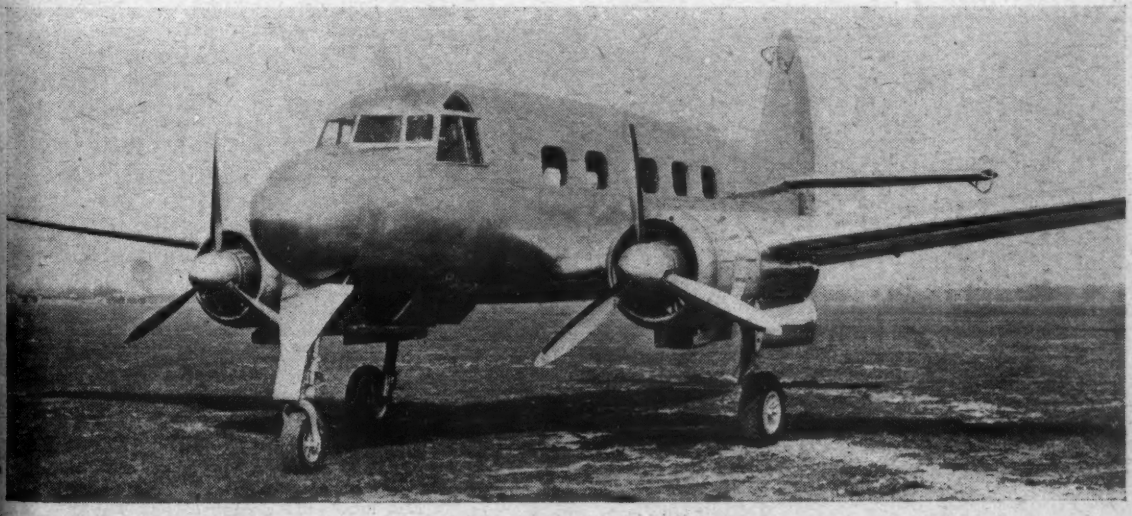
At the cockpit nose is a bulkhead frame hung with two doors affording access to the front of the instrument panels and the rudder controls, etc.; the extreme nose of the fuselage is faired by a detachable nose cap. An escape hatch about 24in by 18in is incorporated in the centre of the cockpit roof, and on each side of this are triangular glazed panels which should be useful in giving inward visibility during turns. Referring to escape hatches we might mention that two windows in the fuselage (over the wings) are incorporated with pull-in panels.

Smooth Skinning

Before leaving the fuselage it is worth while making the observation that the quality of skinning is high, and should the production skinning maintain the standard of the prototype it will serve as an excellent example of what can be achieved by careful workmanship.

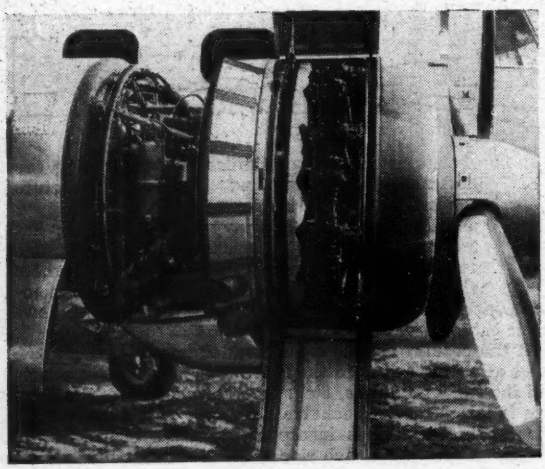
We have already mentioned the basic system of attachment between wings and fuselage. The dihedral, which is constant throughout the span, springs from the centre line of the aircraft.

The centre-section main spar is an I-beam with extruded T-booms (of constant section) and a plate web, the centre line joint being made with doubling plates to the web and straps and fishplates to the booms. By contrast the rear spar is a channel-section member made with heavy-gauge rolled-angle booms attached to the forward face of a plate web. The attachment fitting joining the spar to the fuselage is a half-inch plate bolted to the rear face of the spar and extending inboard to pick up a spherical seat trunnion.

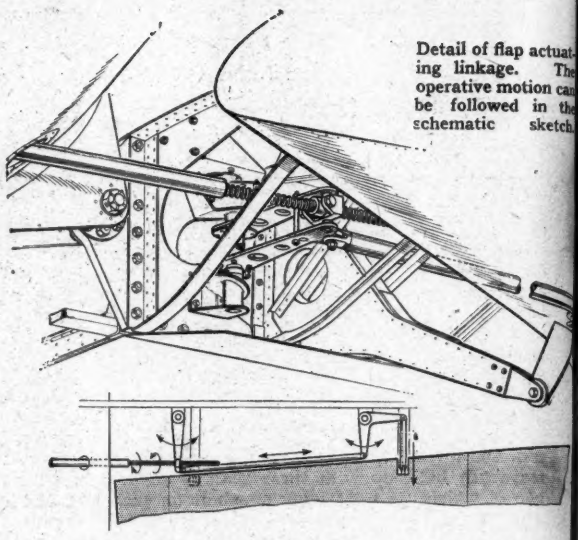


The first prototype is fitted with tail-chute guards to the tips of the tail surfaces, the chute itself being housed in the roof blister just forward of the fin.

THE CONCORDIA



Hinged and removable cowling panels permit excellent accessibility to the Leonides power plants.



Detail of flap actuating linkage. The operative motion can be followed in the schematic sketch.

which is pin-jointed to the triangulated plates carried by the spanning structure and the fuselage frame, as already mentioned. The purpose of the trunnion is to accommodate manufacturing tolerances.

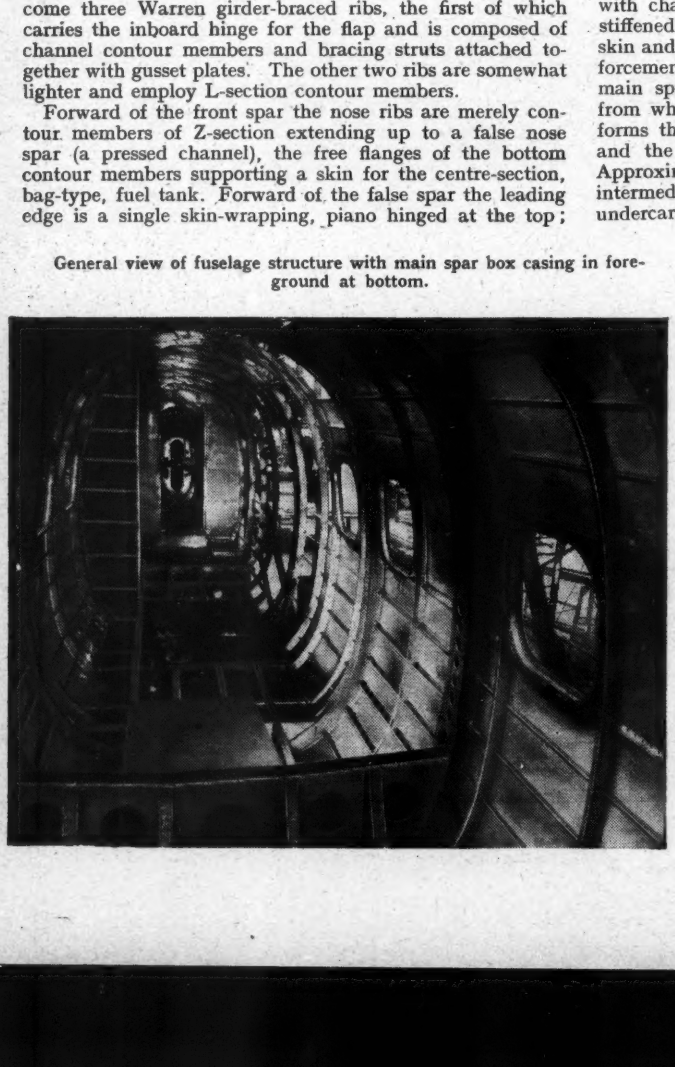
Inter-spar ribs start with the inboard end rib formed as a heavy diaphragm with channel-section extruded booms to the bottom contour and T-section to the top. Next come three Warren girder-braced ribs, the first of which carries the inboard hinge for the flap and is composed of channel contour members and bracing struts attached together with gusset plates. The other two ribs are somewhat lighter and employ L-section contour members.

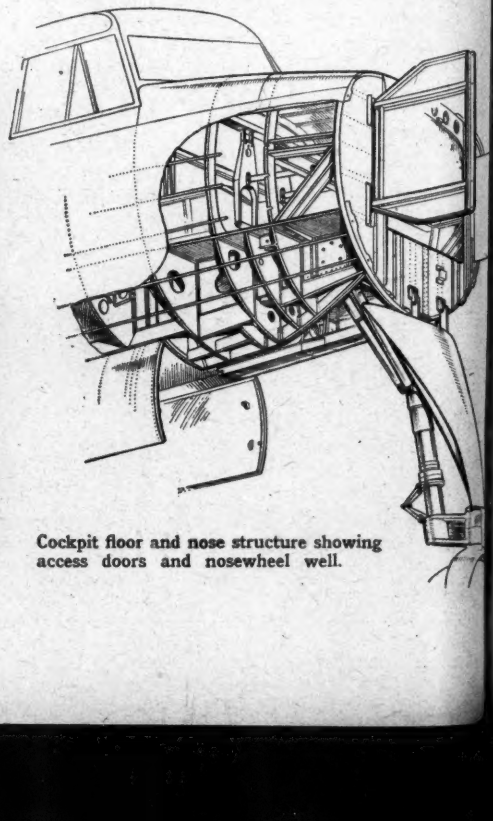
Forward of the front spar the nose ribs are merely contour members of Z-section extending up to a false nose spar (a pressed channel), the free flanges of the bottom contour members supporting a skin for the centre-section, bag-type, fuel tank. Forward of the false spar the leading edge is a single skin-wrapping, piano hinged at the top; the engine controls and services run along the false spar. Fuel capacity is 212½ gallons divided between a 52½-gall. outer wing tank and a 54-gall. centre-section tank port and starboard. All tanks are Marflex bag-type crashproof units which, complete with fittings and pumps, weigh but 26½lb each for the outer wing and 32½lb each for the centre-section installation.

Power-plant Mounting

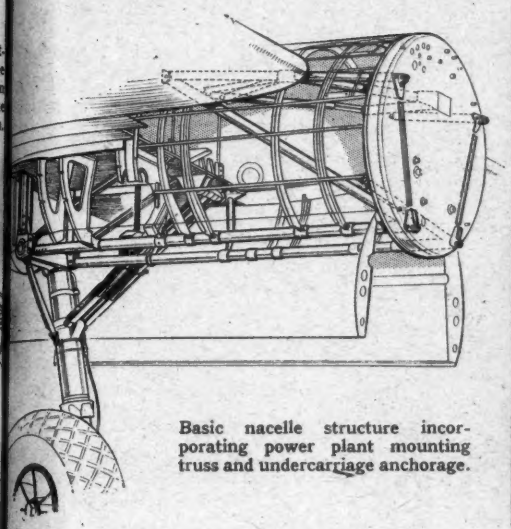
In way of the nacelle are two inter-spar ribs of box form with channel contour members and plate webs internally stiffened with further channels. At the intersection of skin and webs a contour angle member provides boom reinforcement. The extensions of these two ribs forward of the main spar form the side members of the root structure from which the power plant is mounted; the inboard rib forms the outboard end wall of the inner fuel tank cell, and the outboard rib is of tubular girder-braced type. Approximately 3in inboard of the nacelle centre line is an intermediate inter-spar rib which takes the reaction of the undercarriage screw jack.

General view of fuselage structure with main spar box casing in foreground at bottom.

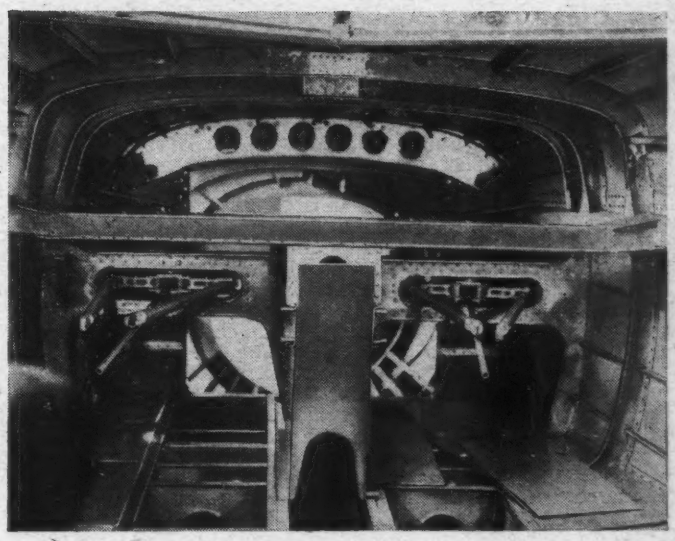




Cockpit floor and nose structure showing access doors and nosewheel well.



Basic nacelle structure incorporating power plant mounting truss and undercarriage anchorage.



Cockpit nose structure showing pedestal and support for rudder pedal toggle linkages.

Firewall and engine pick-up points are carried by a system of tubular struts giving triangulation, and the horizontal bottom tubes extend aft to the rear spar, where they pick up to vertical posts off the spar. The main undercarriage pivot bearings are bolted-up at the junction of the horizontal tubes and vertical posts. Fairing panels carried on pressed sheet frames and bulb-angle extruded stringers enclose the nacelle sides, and behind the undercarriage pivot point the tail cone is skinned on pressed sheet ribs.

The outboard ends of the centre-section main spar terminate with machined fittings of fork and lug pattern for picking up the outer wing panels, the top fitting having its pin vertical whilst the bottom pin is horizontal. The rear spar attachment consists of a built-up plate fork-fitting, bolted to the booms and horizontally bored for the single pin joint.

Outer Wing Structure

In the outer wing the main spar is an I-beam similar in structure to that in the centre section with the exception that both booms are taper-machined in width, depth and thickness. The rear spar, as a continuation of the centre-section rear spar, extends only through four rib bays of the outer wing, i.e., about 5ft 6in. This spar is a shallow channel-pressing with angle reinforcing booms to make a finished I-section. It is overlapped approximately 2ft 9in by the outer rear spar which, roughly 5in rearward, is a Z-section member which starts at the inboard end of the aileron and extends to the tip; the aileron is piano-hinged at the top angle of web and flange.

The outer-wing inboard end rib is of box form as previously noted for carrying the flap hinge, the rest of the ribs being light Warren girder-braced components with angle contour booms and channel bracing struts.

CONCORDIA DATA

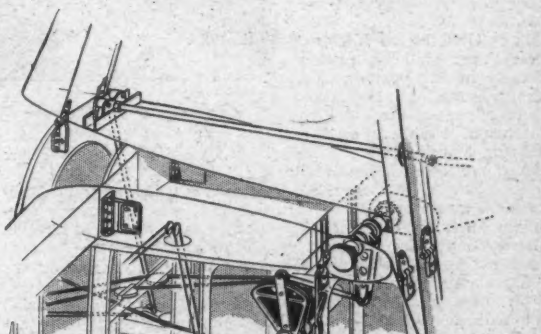
Two Alvis Leonides LE4R Engines of 550 h.p. each. Driving Rotol Three-blade 9ft diameter Airscrews.

Span	... 56ft 7.625in	Tailplane and elevator area, gross	... 83.2 sq ft
Length ...	... 44ft 9.625in	Fin and rudder area, gross	60.1 sq ft
Height ...	... 16ft 8.5in	Flaps area ...	... 51 sq ft per wing
Ground angle	... 15 deg	Gross weight	... 12,500lb
Wheel base ...	... 14ft 11.63in	Wing loading	... 28.8lb/sq ft
Track ...	... 15ft 4.25in	Power loading, take-off	11.36lb/b.h.p.
Wing area, gross	... 435 sq ft	Percentage structure weight	35.6 (10.3 wing)
Aspect ratio	... 7.48	Max. WM cruise	... 194 m.p.h. at 9,500ft
Aerofoil section, root : ...	... NACA 4415	Recommended econ. cruise	160 m.p.h. at 7,000ft
tip : ...	... NACA 4412	Recommended cruise, one engine dead	... 100 m.p.h. at sea level
Standard mean chord	7.622ft		
TC ratios, root	... 15 per cent		
tip	... 12 per cent		
Dihedral ...	... 6 deg 30 min		
Incidence ...	... 3 deg		
Tailplane span	... 20ft		

Centre-section and outer-wing skinning is stabilized by L-section intercostals, which decrease progressively from 18 gauge at the inboard root ribs to 22 gauge at the tip. Pitching decreases from 7in at the root rib to 5½in at the centre-section outboard end rib, whilst in the outer wing the pitch is 5½in throughout, all being set parallel to the main spar. There are the same number of intercostals both to the upper and lower surfaces.

Flaps are N.A.C.A. slotted type, built-up with pressed ribs and continuous stringers of lipped angle section. The three flap-hinge ribs are doubled, the forged fitting for taking control loads being carried between the two sides of the centre hinge rib. Each aileron is built up on a pressed spar of Z-section in conjunction with pressed sheet ribs and intercostal L-section stringers.

The tailplane is a two-spar structure, the main (rear) spar being an I-beam of conventional form, to which machined fittings are bolted to pick up the complementary fittings previously mentioned for attachment to the fuselage. Ribs are pressed sheet units extending to the front



Elevator and rudder control and trimming transmission in fuselage tail cone showing, also, fin and tailplane attachment.

THE CONCORDIA

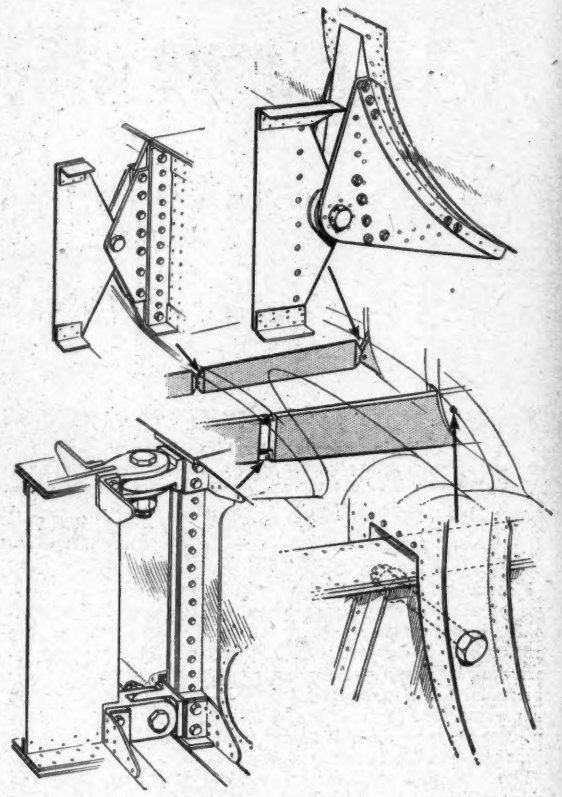
spar, which is a pressed channel carrying additional L-section reinforcing booms; the spanwise stringers are bulb-angle members for which the ribs are notched.

Each elevator is built up with a single pressed channel nose spar, forward of which the leading edge is fashioned as a torsion box. Chordal ribs are simple pressed-sheet units, and these are supplemented by intercostal bulb-angle stringers. Each elevator has a forward-raking horn balance at the tip and is swung on three self-aligning ball-bearing hinges which are carried off the tailplane rear spar. The inboard ends of each elevator are cut-away in order to permit rudder movement, the aerofoil section of the elevator at this station necessarily having an abruptly rounded trailing edge. On each elevator is a metal tab, that on the post surface being a trim tab, and that on the starboard surface a conventional-type geared servo tab.

The fin is built up on two spars, or posts, the forward member raking aft and the rearward member raking forward. Both fin posts are pressed channels with boom reinforcement, and the chordal ribs are pressed sheet diaphragms stabilized with L-section strips; the attachment fittings to the fuselage are conventional fork and lug units as already described.

Structurally the rudder is essentially similar to ailerons and elevators, and it is swung on three self-aligning ball-bearing hinges. A split tab is embodied in the trailing edge, the lower portion being a trim surface, whilst the upper portion is a geared servo. Approximately 8in below the tab the rear navigation light is embodied in the trailing edge. Rudder actuation is accomplished by a push-pull rod emerging from the side of the fuselage just forward of the rudder, this being pivoted to a horn lever carried to starboard off the rudder spar.

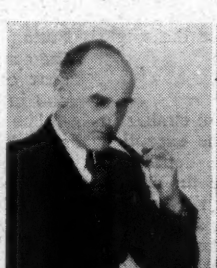
T.K.S. de-icing strips are incorporated in the leading edges of the outer wings, tailplane and fin.



Details of spar attachments and joints. These should be viewed in relation to the main cut-away drawing.

R.Ae.S. MEDALS AND PRIZES

Mr. Edwin Link



Mr. J. Smith C.B.E.

Mr. W. G. Carter, M.B.E.

Prof. Leslie Aitchison

IT has been announced that the following awards have been made by the Council of the Royal Aeronautical Society: The Simms Gold Medal, for the best Paper read before the Society in any year on any science related to aeronautics, goes to Professor L. Aitchison, Professor of Industrial Metallurgy at Birmingham University for his Paper "Aeronautics and the Metallurgist."

Professor A. R. Collar, Sir George White Professor of Aeronautical Engineering, Bristol University, gets the George Taylor (of Australia) Gold Medal awarded annually at the discretion of the Council for the most valuable Paper submitted or read during the previous season. Professor Collar's contribution was "Aeroelastic Problems at High Speed."

Mr. Edwin Link, designer of the Link Trainer, was awarded the Wakefield Gold Medal which is presented annually to the designer of any invention or apparatus tending towards safety in flying. The Society's Silver Medal awarded at the discretion of the Council for some advance in aeronautical design goes to Mr. W. G. Carter, Chief Designer of the Gloster Aircraft Co., for his work on the development and design of jet-propelled aircraft.

Mr. J. K. Harvey, Royal Aircraft Establishment, has won the R38 Memorial Prize offered each year for the best Paper received by the Society on some subject of a technical nature in the science of aeronautics, preference being given to Papers which relate to airships. The subject chosen by Mr. Hardy was "Protection of Aircraft Against Ice."

Finally, the Edward Busk Memorial Prize for the best Paper received by the Society on some subject of a technical nature in connection with aircraft, including seaplanes, this year goes to Mr. J. Smith, Chief Designer, Vickers-Armstrongs, Ltd., Supermarine Works, for his "Development of the Spitfire and Seafire" Paper.

A HAWKER RESIGNATION

AFTER sixteen years with the firm, Mr. Philip Lucas has resigned from his position as director and general manager of Hawker Aircraft, Ltd. We gather it is a question of a difference of opinion on policy. Mr. Lucas joined the company as test pilot in 1931, and did much demonstration and delivery work during the Hart and Fury period. The later Hawker types were his responsibility, and it was while testing the prototype Typhoon that the fuselage began to break, but Lucas stuck to the machine and landed it safely, a cool piece of courage which saved long delays in production, and for which he was awarded the George Medal.

AUSTER DISTRIBUTORS

LOXHAM'S have been appointed Auster distributors for the whole of the North East of England. They are already handling the distribution of Auster aircraft in the N.W. area.

"Flight" photograph.

The Nord 1200 sports three-seater. The tricycle landing gear is mechanically retracted.

NORECRIN IN THE AIR

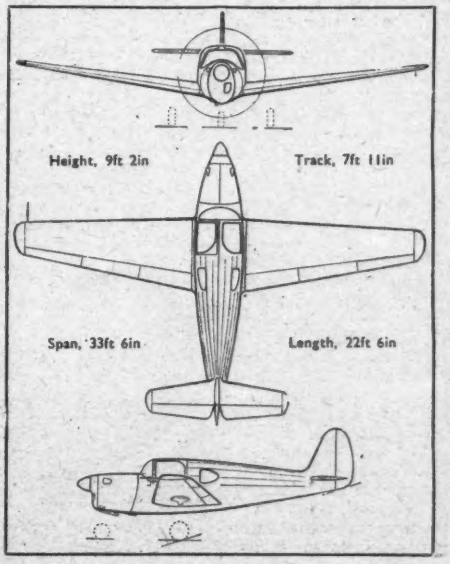
Flying Characteristics of a Light French Sports Tourer

JUST as most French sports cars have an air and character of their own which, though pronounced, is most difficult to define, so the Nord 1200 is unmistakably French. There is a mechanical crispness mixed with ingenious detail, but also with a dash of the illogical.

Since the design was first introduced there have been several minor changes, but the later model which I flew is basically similar to earlier ones. The somewhat unusual tricycle landing gear has a fully spatted nosewheel and leg under the engine, and all three wheels are manually retracted. The cabin contains three seats, the single rear one being placed cornerwise behind the front passenger. The footrests for mounting the wing, no longer in the flaps, are precarious, smooth, tubular affairs projecting from the fuselage. Entry and exit are quite convenient operations due to the provision of wide forward-opening doors in the enclosure. Pilot and co-pilot are provided with comfortably placed controls and sliding seats which really slide or lock as desired.

The instrument panel, a section of which is rubber mounted, carries an assortment of dials and knobs, rather poorly designed and arranged. Ashtrays and map compartments are also provided. The fuel tank cock is operated by a sort of 6in-long drumstick pointing outwards towards the pilot, and the ignition "switches" are operated by a second long drumstick beside it. The priming knob is small and hard to turn. The instrument grouping is quite acceptable, but the small dials could be clearer. Brakes are fitted for the port side seat only, and so also is the flap lever, but fore-and-aft trimmer wheel, throttle and undercarriage lever are central.

When locked, the enclosure is draught-proof, and the noise level is low enough to permit conversation without strain. The present 140 h.p. Renault Bengali will be replaced in production by a Regnier of similar power, and there is no reason why Gipsy or Cirrus Major engines should not be fitted as alternatives. The fair degree of quietness with the present Renault must be due, in part, to the medium-long exhaust pipes leading back under the wing.



Air and Ground Handling

The chief test pilot of the Nord group, M. Georges Detré, first demonstrated the characteristics of the aircraft to me. Although he taxied very fast over the grass airfield, the ride was quite smooth, and I found that manœuvring was quite simple, using brakes in the normal way. The large windscreen and narrow nose permit an exceptionally good forward view on the ground. The take-off run was quite short, but in spite of the nosewheel there was considerable torque effect, necessitating use of plenty of left rudder and, initially, a touch of left brake. A 15-deg take-off position for flaps is provided. The best climbing speed seems to be about 90 m.p.h. but there is plenty of control if the machine is eased off the ground at about 70 m.p.h.

The retraction of the wheels is entirely mechanical, although the action of the lever is similar to that of a hydraulic pump. A double ratchet and gear system is employed, and according to the position of the catch, the wheels go up or down as a result of "pumping." If the wheels are not entirely down, the mechanical nature of the retraction would lock them sufficiently to support the aircraft, and the company point out that although the mechanical system may be rather heavy, it is most reliable and requires no spares or special inspections. I did not count the number of strokes of the lever to retract the wheels, but it was about thirty.

NORECRIN IN THE AIR

Unlike many light aircraft, the rudder of the Norecrin is fairly heavy and might be compared with several of the larger single-engined military aircraft. The machine is directionally very stable in the air, and an unusual flying characteristic, which I was able to try for myself, was the ability, having trimmed fore-and-aft for level flight, to make quite passable S-turns with rudder alone.

As would be expected from the appearance of the machine and the availability of 150 h.p., the cruising and high-speed performance are good. At between 2,100 and 2,200 r.p.m. the cruising speed built up to about 125 m.p.h. I did not make a long run at maximum r.p.m. but the quoted top speed of 165 m.p.h. seems to be on the high side.

Fair warning of the stall is given in the conventional sloppy-control manner, and the aircraft is fully stalled at 40 to 45 m.p.h. with the full 40 deg flap, and about 5 or 6 m.p.h. faster with flaps up. The left wing drops fairly quickly in an incipient spin, but I do not regard the stall and spin characteristics as unreasonable for the aircraft, and the recovery is positive and rapid. After flying several "safety" aircraft recently one is apt to get the impression that any aircraft which drops its nose or shows signs of spinning verges on the vicious; this, of course, is not true.

To appreciate the Norecrin and to give a fuller description of its flying characteristics, it would be necessary to do several hours on it and to get used to the controls and even the instruments, but as a first impression it is fair to say that the performance is good and the controls are smooth and well balanced.

The approach to land is made at 75 m.p.h., and the landing itself presents no difficulties. The machine might be brought in a little faster and flown on to its three wheels, but the slightly tail-down, hold-off technique is preferable. The touch-down speed is quite low, considering the aircraft's performance, and with the use of brakes and nosewheel the landing run can be made exceptionally short.

The Norecrin was on a friendly return visit to Hunting Aviation, Ltd., at Luton, and in addition to Nord's chief test pilot, the S.N.C.A.N.'s president and commercial manager were among the French party who are seen in the illustration with Mr. W. A. Summers, managing director of Hunting Aviation Management, Ltd., who visited the company in France a few weeks ago. M.A.S.

FRENCH VISITORS AT LUTON: (Left to right) **Mr. W. A. Summers, Managing Director of Hunting Aviation Management Ltd.; Mr. Maurice Smith, *Flight*; M. Maurice Gateau, Commercial Manager of S.N.C.A.N.; M. Anton Pissavy, President and Director-General of S.N.C.A.N.; M. E. Ambrassart, Works Manager at Les Mureaux near Paris, where Norecrin and Noralfa are building; M. Georges Detré, chief test pilot of the Nord group, M. Henri Demay, Caudron's chief test pilot, and M. E. Marton, Nord engineer.**

NORD 1200 NORECRIN

Max. speed ...	165 m.p.h.
Cruising speed ...	143 m.p.h.
Rate of climb S/L ...	1,180 ft/min
Rate of climb 3,000ft ...	1,100 ft/min
Take-off distance ...	525 ft
Service ceiling ...	19,680ft
Range at cruising ...	560 miles
Weight empty ...	1,186lb
Fuel	205lb
Pay load ...	538lb
Total weight ...	1,929lb

SECRET DESTINATION

MR. JOHN DEDMAN, Australian Defence Minister, speaking in a Parliamentary Debate in Australia, said that members of the expedition conducting the forthcoming rocket tests in Central Australia would travel by air to a secret destination to remove any possibility of pre-arranged contacts with the outside world. Even contacts with natives was regarded as an extremely remote possibility. Mr. Dedman was speaking on a motion protesting in the interests of the natives against establishment of the range.

THE BLACKPOOL AIR PAGEANT

TAKING the place of Empire Air Day this year will be the Blackpool Air Pageant, organized by the Air League of the British Empire. The Pageant is to be held at Squires Gate from July 2nd to 23rd and will be open from 10 a.m. to 9 p.m. each day except Fridays. Flying displays will take place on July 2nd, 9th and 16th from 2 p.m. until 6 p.m. with units of the R.A.F. and Naval Air Arm providing the flying. In the aircraft park will be shown a wide range of Service and civil aircraft and also a number of captured German machines. If the weather is calm it is hoped to fly a Blériot monoplane similar in practically every detail to the one in which Blériot first flew the English Channel in 1909.

The Pageant has been timed to coincide with Wakes week, and it is estimated that 100,000 people will be admitted during each flying day. Squires Gate is the site of the first officially supported aeronautical display held in England in 1909.

A free 10s ticket will be supplied to every full member of the Air League who applies for it at least a fortnight before the opening. The Blackpool Pageant will culminate a series of four air displays under the auspices of the Air League.

The first took place at Portsmouth. The second at Whitchurch airport, Bristol, and the third is scheduled to take place at Baginton, Coventry.

DEATH OF H. J. THOMAS

WITH the death after an operation on May 20th of Mr. H. J. Thomas, assistant managing director of the Bristol Aeroplane Company, British aviation has lost one of its pioneer workers. Herbert John Thomas, who was born in 1892, spent his whole life in aviation. He was one of the original team who formed the British and Colonial Aeroplane Company, under Sir George White, Bart., in 1910, and remained with the firm up to the time of his death.

The late H. J. Thomas.

Thomas was one of the earliest British pilots, his Royal Aero Club certificate being No. 51, and at the time he was the youngest pilot to hold a licence. He was works manager of Bristols for 25 years, including the period of the first World War, when the famous Bristol Fighter was built in large numbers. Of public offices he had held several, and had been chairman and member of the council of the S.B.A.C. In September last year he was appointed Sheriff of Bristol.

Mr. Thomas leaves a widow and two sons, to whom we extend our sympathy.

Skyways' First Anniversary

The Year's Work : Middle and Far East Contracts

ALTHOUGH most people will know something of Skyways' activities, it is perhaps surprising that comparatively little is heard of this, the largest air charter company in Europe. The main reason is a good one—that the company are in the happy position of having had more than enough work during their first year of operation to keep them fully occupied, and have been too busy keeping their growing fleet of aircraft in the air to talk much about them.

The company rent their airfield at Dunsfold from the Government and, although it suffers the disadvantage of having a dispersed-type layout, the advantages of having a full-size airfield with good runways, hangars, control tower, living sites and all the workshops required are obvious.

On a recent visit to Dunsfold, *Flight* examined the facilities which the company have built up in twelve months and which they are still improving and expanding.

If such a company has to operate successfully it is essential to get the maximum use out of its aircraft, and in these days of shortages and delays the only sure way of getting a job done when and how one wants it is to do it oneself. That is what Skyways have aimed to do. An enormous amount has been achieved in twelve months, but it is still too early to have collected sufficient statistics to give more than a rough indication of maintenance, spares and other requirements. As an example of operating hours, however, the year's figures for two Yorks, which have been the company's work horses, reflect very favourably on the efficiency of organization. Both have done approximately 2,200 hours.

Staff and Aircraft

There are now some 1,300 staff at Dunsfold, excluding aircrew who number about 350. A 24-hour working schedule is maintained for all essential sections including, of course, met. and flying control.

Skyways' present fleet consists of a Skymaster, the first of several, Yorks and Lancastrians, D.C.3s, a Dove and a Rapide. At present the Lancastrians are used chiefly for fast, heavy freight carrying, but as other aircraft become available they will be used chiefly for training. The principal contract work is the transport of oil company staff to and from Basra. There are some 5,000 employees, plus their families, to be carried to and from Basra on first appointment, on duty, and when their one month's vacation in twelve becomes due. This, of course, is only one of Skyways' commitments, and arrangements are now being completed for the formation of a Skyways Far East company for the operation of contract airlines south and west of Siam.

Crews report for duty 24 hours before they are due to fly, and in the intervening period pilots are checked out on instrument flying and the planning and briefing are completed. A trip to Basra and back involves about 35 flying hours in four days, and crews are expected to make three trips a month or an equivalent number of flying hours on other duties.

Living Quarters

A large proportion of the ground staff are accommodated at Dunsfold airfield, which is about seven miles from Guildford. Single men and men living apart from their families occupy four of the original Air Force sleeping sites, and a fifth is let as married quarters. The thousand-odd maintenance staff undertake complete repairs and overhauls of all the company's aircraft.

It has been estimated that for every unnecessary day spent on the ground by a York the company lose £1,000, and for a Skymaster £1,300 to £1,400. The thorough and excellent organization which Skyways has built up would therefore seem to be justified if, as has been found possible, the turnround of aircraft can be greatly speeded up.

There is an important and satisfactory agreement existing between Skyways and the corporations, and as far as possible when operating over routes in the B.O.A.C. sphere of influence the company operate from London Airport and are able to make use of the corporation's *en route* facilities, while over B.E.A. routes they operate from Northolt and a similar maintenance arrangement exists. The arrangement is subject to the company's aircraft being maintained to a standard at least equal to the corporations' aircraft and, of course, corporation aircraft take priority in servicing requirements. The arrangement is very satisfactory for both sides because the one would not, for the time being, be justified in setting up intermediate bases while the other is forced to, but cannot yet employ them fully and therefore economically.

DEATH OF CHARLES DESOUTTER

WE regret to announce the sudden death of Charles Desoutter, managing director of Desoutter Brothers, Ltd. In the earliest days of flying the name became well known. Marcel was a famous Bleriot pilot, Rene did test-flying for Gordon England, and Charles was more the engineer of the family. When Marcel lost his leg in a crash, he and Charles designed a very light aluminium leg, and from that beginning developed an extensive business in artificial limbs. In more recent times the firm has won fame for its lightweight pneumatic and electric portable tools. With the death of Charles Desoutter the business has suffered a severe loss.

DERBY INTERNATIONAL AIR RALLY

ON Friday, June 20th, light aircraft from all over Europe will fly via Lympne to Derby for an International Air Rally which will be held at Derby Airport on Saturday, June 21st.

The Rally has been organized by the Derby Aero Club in collaboration with the Derby Corporation and the Royal Aero Club of Great Britain, and the main object is to enable the pilots of the United Kingdom to return in some measure the hospitality extended so often to them on the Continent. It will also be an opportunity for international aviation interests to get together and to foster goodwill between the nations.

The provisional programme already includes the following items: arrival and demonstration of Aerovan; race between five Magisters for the Harben Memorial Trophy; glider and light aircraft aerobatics; fly-past by a Bleriot; high-speed demonstration by G/C. Donaldson in a Meteor; Rolls-Royce demonstration of the Nene Lancastrian, Nene Vampire, Meteor IV and Trent Meteor; Dove and Chipmunk demonstrations; an R.A.F. event; a parachute descent; and a fly-past of selected visiting aircraft. The Nene Vampire will be making its first public appearance, as will also the Trent Meteor—the first aircraft to fly with airscrew turbine engines and, it is believed, still the only machine to have flown powered solely by such engines.

Of interest to light plane enthusiasts will be the numerous small aircraft from the Continent, which will include a Bücker "Bestman" and a Piper Super Cruiser.

The meeting will be truly international, as more than 50 foreign visitors have already accepted and propose to come by air. They will foregather at Lympne on Friday afternoon, and there will be a sort of aerial Cook's tour, personally conducted by pilots from Derby, up to the airfield at Burnaston.

On Friday evening, Rolls-Royce are giving a cocktail party at which the Ministry of Civil Aviation will be represented. Guests will include the Rt. Hon. Philip J. Noel-Baker (who is, incidentally, the M.P. for Derby) as well as the Parliamentary Secretary, and Group Capt. C. A. Wilcock, also M.P. for Derby and chairman of the Derby Aero Club. A dinner will be given on Saturday night at which there will be many distinguished visitors.

INTER-ISLAND HELICOPTERS

HELICOPTER AIR TRANSPORT are said to be negotiating with the British Government to run a helicopter service between islands of the West Indies. Argument for Helicopter Air Transport is that this form of transport would save the cost of building airfields.

FRENCH OPTIMISM

GEORGES FEVRIER, writing in the April issue of *L'Aerophile*, speaks encouragingly of French private flying. Aviation is a necessity of modern life, says Georges, and he looks forward to the day when business men, doctors and professional men generally, recognize flying as a common means of travel. Although the difficulties and obstacles to private flying in France are recognized, Georges Fevrier strikes a note of optimism which is welcome to all enthusiasts of private flying.

CIVIL AVIATION NEWS

DUTCH FOUR-SEATER: The Fokker Promoter, equipped with tricycle undercarriage, was described in *Flight* of October 3rd, 1946. Those who saw it fly at the recent Ypenburg rally were impressed with its general manœuvrability and good climbing qualities.

B.A.L.P.A. Criticizes Accident Reports : Aircraft Flying on British Airlines : New Aid to Bad-weather Landing

ALLOCATING THE BLAME

THE Air Safety and Technical Committee of the British Airline Pilots Association has studied and made comments upon the Chief Inspector of Accidents' reports on two recent crashes. In both cases the pilot was a member of B.A.L.P.A., and in both reports adverse comment on the pilot's ability was made.

The first report is concerned with the Avro XIX which crashed at Speke on August 16th, 1946. The aircraft, being flown on test by Capt. D. C. Harrison, crashed after attempting to go round again with one airscrew feathered. The overshoot was made to avoid collision with an aircraft taxying near the runway in use. The Committee considers that the circumstances leading to a probable crash by collision, and, in fact, to the actual crash, during avoiding action resulted from lack of airfield control, and considers it inexcusable that one aircraft should be allowed to taxi near the runway in use at a time when another aircraft was landing. Although Capt. Harrison was guilty of faulty technique in failing to retract his undercarriage or leaving overshoot action too late, the Committee considers that he was so fully occupied in attempting to correct swing that his error was understandable.

The second report concerns the B.S.A.A. York which crashed soon after take-off at night from Yundum airfield on September 7th, 1946, as reported in *Flight*, April 24th. The Committee has taken strong exception to the "opinion" expressed that the accident occurred as a result of the pilot losing control of the aircraft. "Any opinion qua opinion," it says, "is dangerous, but it is doubly so when other possibilities which are equally valid are ignored." There was, for example, no mention of ambient temperature, and the Committee complains that there was too little emphasis placed upon the fact that the aircraft took off on a heading of 227 deg and crashed on a track of 110 deg, which indicated that a turn had been forced upon the pilot. There was, in consequence, a suspicion of port outer engine failure, and yet no mention had been made of the possibility because of the conclusion, after technical inspection, that there was no such failure. A further possibility was instrument failure, particularly as the take-off was at night. The Committee points out that the three-engined rate of climb of a York weighing 68,770 lb in normal flying conditions would be about 150 ft/min, but with airscrew windmilling and flaps at take-off position the rate of climb would be negative.

The Committee then puts the question whether the operation was safe. Even though the flight was in accordance with legal requirements, it is thought that at a weight of over 68,000 lb and under conditions obtaining at Yundum, even with all engines functioning perfectly, the take-off would demand a high degree of skill and pilot experience, and yet the pilot of this aircraft was making his first take-off from that airfield in a York aircraft. The Association points out that it has already expressed doubts about the performance of the York, and considers that no aircraft should be permitted to fly without a safe performance with one engine not functioning. If, in this instance, the port outer had failed, it is thought that not even the most experienced pilot could have saved the situation.

The Association makes the further observation that shortly after this accident the maximum all-up weight for that type of aircraft was reduced to 68,000 lb, and also that the Ministry of Civil Aviation were prepared to condemn by implication a pilot as being inexperienced on a type when at the same time, by their own regulations, a pilot was accepted fit to fly for hire or reward with a limited number of hours and without proof of night flying on the type.

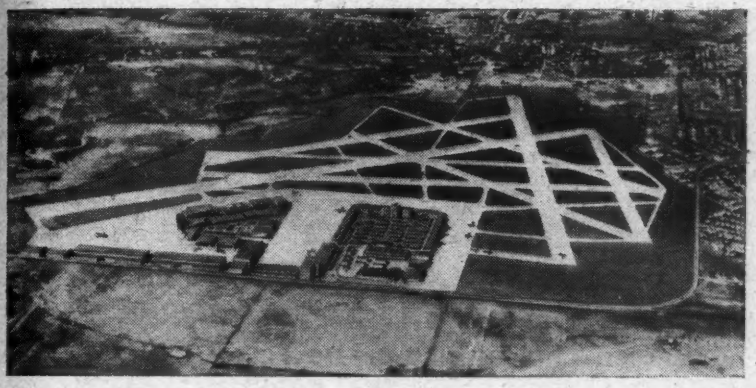
AVIATION EXPENSES

EXPENDITURE for I.C.A.O. during the coming year has been assessed at £500,000. The United States will pay the largest share of £105,000, the U.K. £70,000, and Canada, France and China will each pay £35,000. Denmark has asked the Committee for aid in establishing navigational facilities in Greenland and the Faroe Islands, on the ground that the expenditure would be out of proportion with Danish interests in the North Atlantic route. Sir William Hildred, Director-General of I.A.T.A., recently criticized the amount of money being spent by the international civil aviation organizations to conduct meetings. He was appalled, he said, by the expenses of the various Ministries of Civil Aviation, technical facilities and also I.C.A.O., which were piling up on fare-paying passengers. He warned against over capitalizing air transport and said that the organizations attached to I.A.T.A. were not interested in political questions.

MELBOURNE AIRPORT

RECONSTRUCTION of Essendon Airport, just outside Melbourne, which was commenced in 1940 but held up later in the war, has been going ahead rapidly and the first of the main runways has been completed. Stage two involves the construction of two more runways and stage three the construction of two in a fourth direction and duplication of the others, making eight in all. The building area covers a hundred acres, and ground will be let to the airline companies for the erection of their own buildings, which must be designed to fit in with the general architectural plan of the scheme.

The apron is to be 3,500ft long and capable of holding twenty-four aircraft simultaneously. The administrative buildings are to be situated behind the airline companies' premises, and will include normal flight briefing rooms and Customs, dining rooms, a post office and some shops. Workshop and maintenance buildings will be situated clear of the passenger area, and there will be parking space provided for several hundred cars. Dr. Bradfield, chief airport engineer in the Department of Civil Aviation, is responsible for the design of this and all other airports throughout the Commonwealth.



UNUSUAL RUNWAY PATTERN: A photo-sketch of Essendon Airport as it will appear when completed. The longest runway is in the NW-SE direction and measures 2,350 yd. The other main runways are 2,000 yd, 1,600 yd and 1,135 yd long. In the centre foreground can be seen the main buildings, on the extreme left the hangars and workshops, and in between is the apron with loading bays.

He has made a study of airports, and although born in New South Wales, he spent some time with Norman and Dawbarn, the London architects who specialize in airport design.

CANARY ISLANDS AIRLINE

AN airline, Atlantis Air, Ltd., has been formed by Killick Martin and Co. and Elder Kempster, of the Canary Islands, to fly services three times a week between England and the Canary Islands. The new service, which starts on June 15th, will fly from Northolt to Gando, Gran Canary, stopping at Lisbon en route. Yorks and Skymasters will be used, and the flight will take about 8½ hours. Killick Martin and Co. and Elder Kempster are agents for the leading shipping companies calling at the Canary Islands, the former being registered by I.A.T.A. as an airline agent.

CIVIL FLYING IN INDIA

DURING the whole of 1946 there was only one accident on scheduled services in India, and in that one there was neither fatality nor injury to crew or passengers. The flying clubs had a total of eleven accidents, involving the death of one pupil pilot under training. In private and other flying there were seven accidents, in which one person was injured and two were killed. One private owner was killed as a result of reckless flying, and a transport aircraft, whilst on a non-scheduled flight without passengers, crashed in a storm at night with the loss of two pilots.

Twenty-eight airfields and landing grounds have been taken over from the Defence Department, thus bringing the total number of civil airfields up to fifty. Flying control has been taken over by the Directorate of Civil Aviation at Karachi, Ahmedabad, Bombay, Lahore and Delhi, and it is understood that the transfer of control from the air forces at other airfields has been arranged. Communication facilities and navigational aids have been taken over from the Services at Karachi, Delhi, Bombay, Ahmedabad and Jharsaguda. Plans for the development of Indian international airports and flying facilities have reached an advanced stage, but actual construction has not yet been started. Airline operations are, therefore, subjected at the present time to considerable handicap.

LONDON-SHETLAND SERVICE

BRITISH EUROPEAN AIRWAYS started on May 19th the daily service from London to Shetland, via Edinburgh and Aberdeen. This new service is over the longest internal route in Britain, the distance between London and Shetland being just over 700 miles. The daily timetable is as follows:—

	Arrive		Depart
Northolt	—	..	8.55
Turnhouse	11.10	..	11.35
Aberdeen	12.20	..	12.50
Shetlands	14.10	..	14.30
Aberdeen	15.50	..	17.00
(Wait to connect with services to W. Isles, Orkneys, etc.)			
Turnhouse	17.50	..	18.14
Northolt	20.19		

SCOTTISH DIVISIONAL H.Q.

THE first meeting of the Scottish Divisional Aerodromes Board was held in Edinburgh on May 16th, under the chairmanship of A. Cdre. J. G. Murray. The Air Commodore, who is the Scottish Divisional Controller, said that decentralization of the Ministry of Civil Aviation into the Scottish Division was almost complete, and divisional headquarters had been established at Adamton House, Monkton, near Prestwick. The headquarters will have a full technical and administrative staff, and in the near future will take over control of all State airports and flying facilities for civil aviation in Scotland. The Aerodromes Board was created within the Scottish Division in view of the special circumstances of civil aviation in Scotland, and as announced in *Flight* of April 3rd, Sir Patrick J. Dollan and Sir William J. Thomson were appointed members. The Board is an administrative and executive body, and will be mainly concerned with the non-technical aspect of airfield administration.

FEWER I.A.T.A. REGIONS

TRAFFIC conferences organized by I.A.T.A. for the purpose of dealing with such matters as passenger fares, cargo rates, agency representation, baggage allowances, flight meals, discounts, ground transportation arrangements and similar

AT AMERICAN CELEBRATION: Capt. H. Spry Leverton, U.K. Regional Director, K.L.M., and General H. R. Harris, vice-president and general manager of A.O.A., seen on the occasion of the opening of the American Company's booking hall in Regent Street. On the extreme right is Mr. N. C. Cardinaal, Deputy Regional Director, K.L.M.

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problems have now been reduced in number to cover three large regions. The plan which was set up eighteen months ago, divided the world into nine conference regions, but at the I.A.T.A. General Meeting, in Cairo last October, it was generally agreed that the arrangement was cumbersome. The three new regions are as follow: Traffic conference No. 1, with headquarters in New York, is to cover the North and South American continents, Greenland, Bermuda, the West Indies, the Caribbean area and the Hawaiian Islands, including Midway and Palmyra; Traffic conference No. 2, with headquarters in Paris, is to include the whole of Europe and that part of the U.S.S.R. in Europe, Iceland, the Azores, Africa, Ascension Island, and that part of Asia lying west of and including Iran; Traffic conference No. 3, with headquarters in Singapore, will include the whole of Asia except that portion included in region No. 2, the whole of the East Indies, Australia, New Zealand, and the islands of the Pacific Ocean except those in Region No. 1.

The primary object of these conferences is to achieve the highest degree of economy and efficiency in commercial international airline operation.

BRITISH CORPORATIONS' AIRCRAFT

THE numbers and types of aircraft flying on the passenger services of the three Corporations at the beginning of this month, as stated by Mr. Lindgren in reply to a question in the House of Commons, are reproduced. The figures include aircraft actually on service and those available as standbys, or undergoing periodical overhaul. They do not include, however, aircraft which are used for crew training, development flying, communication flights by the staff or those undergoing modification, or which are permanently out of service.

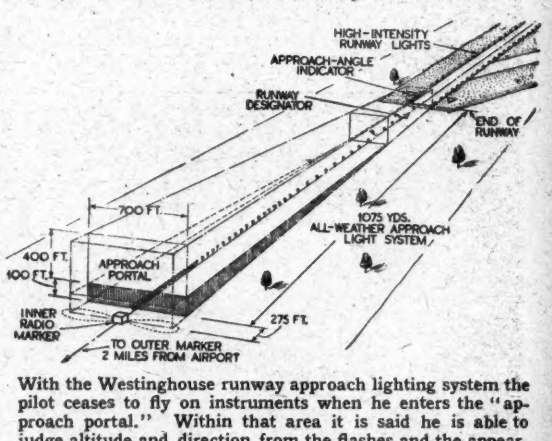
Type of Aircraft	B.O.A.C.	B.E.A.C.	B.S.A.A.C.
(A) Landplanes:			
Avro XIX	—	7	—
Constellation	5	—	—
Dakota	24	18	—
D.H. 89 (Dominie)	—	44	—
Jupiter (Ju.52)	—	7	—
Lancastrian	14	—	5
Lodestar	14	—	—
Viking	—	6	—
York	28	—	10
	85	82	15
(B) Flying Boats:			
Boeing 314A	3	—	—
Short "G" Class	1	—	—
Sunderland (III) (Hythe)	19	—	—
Sunderland (V) (Plymouth)	2	—	—
	110	82	15

RUNWAY APPROACH LIGHTING

A LIGHTING system has been designed by the Westinghouse Electric Corporation in America for the purpose of assisting aircraft landings in poor visibility. The system is intended to supplement but not replace existing radio and radar approach aids, by breaching the gap which now exists between the approach on instruments and the all-important visual touchdown.

Although there are three component parts to the system, only two of them are new, the other being an improvement upon existing runway lighting. It must be understood that homing to the airport and the initial approach and line-up on the runway must be made by normal radio or radar methods, down to a position about ¾ mile before touch-down. On reaching the inner radio marker at 1,075 yds from the runway the pilot transfers from instruments to visual with the aid of the first component of this lighting system.

The first component part consists of a single row of lights from the inner marker beacon to the beginning of the runway, parallel to and 25ft to the left of the extended centreline of the runway. The lights are placed 25ft apart for the outer 300yd, 50ft apart for the middle 330yd, and 75ft apart for



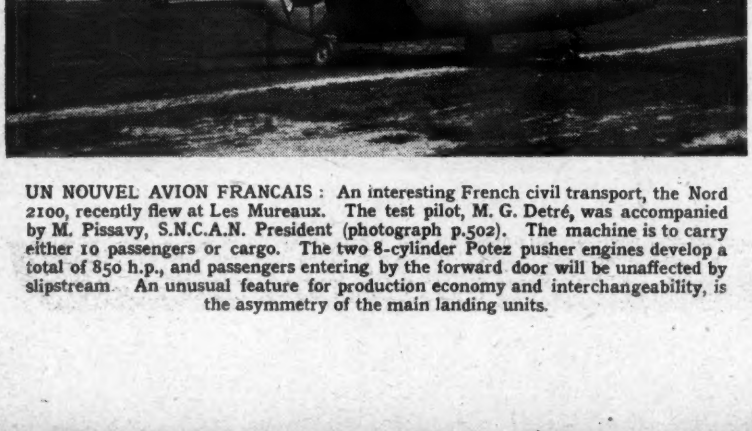
With the Westinghouse runway approach lighting system the pilot ceases to fly on instruments when he enters the "approach portal." Within that area it is said he is able to judge altitude and direction from the flashes and the appearance of the approach line.

the last 400yd. Thirty-six Krypton lights, each with a maximum brilliancy of 3,300 million candle power, are placed alternately with thirty-six Neon lights. The Krypton lamps are only four inches long but when a surge of electricity heats the gas to incandescence the lamp flashes with a maximum brightness of 9 million candle power/sq in. By comparison, the sun at the earth's surface has a brightness of about 1 million candle power/sq in. These lamps are flashed one after another towards the runway at the rate of forty times a minute, to create the effect of a streak of lightning travelling towards the runway which can be seen at 1,000ft, even in the most dense fog. It must be appreciated that the eye will perceive relatively lower apparent candle-power if positively guided to it. In clearer weather the intensity may be reduced and the Krypton lights can be turned off in favour of the less brilliant Neon lights, which may be operated continuously or as flashing lights.

The second part of the system, the runway designator, consists of an assembly of lights forming when required either a green arrow or a red cross, and is situated on the approach line immediately before the beginning of the runway. If the runway is clear for landing the arrow, 83ft long, is illuminated with brilliant green lights, but if the runway is not clear the designator is changed to a flashing red cross. On an airport completely equipped with the system the runway on which an aircraft was landing would have the arrow illuminated, while all other runways would flash the red cross simultaneously.

The third part of the system consists of new, very powerful, runway lights spaced at 200ft intervals along the runway border.

This approach system has already been tested at Cleveland Municipal Airport, and the first airport to be completely equipped will be Idlewild in about eight months' time. It is understood that the Cleveland tests proved the effectiveness



UN NOUVEL AVION FRANCAIS: An interesting French civil transport, the Nord 2100, recently flew at Les Mureaux. The test pilot, M. G. Detré, was accompanied by M. Pissavy, S.N.C.A.N. President (photograph p.502). The machine is to carry either 10 passengers or cargo. The two 8-cylinder Potez pusher engines develop a total of 850 h.p., and passengers entering by the forward door will be unaffected by slipstream. An unusual feature for production economy and interchangeability, is the asymmetry of the main landing units.

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of the system, and it is claimed that it will, when used in partnership with an instrument landing system, make near-visual landings possible in the poorest visibility conditions without the addition of more equipment in the aircraft.

CHARTER ASSOCIATION APPOINTMENT

G/C. W. E. WYNN, after resigning from Hunting Air Travel, was unable to continue as chairman of the British Air Charter Association, and Mr. W. N. Cumming, better known as Group Captain, has been elected in his place. Mr. Cumming is managing director of Straight Aviation Training and a director of Straight Corporation, Ltd., he is also a warden in the Guild of Air Pilots and Air Navigators.

The Association, which will complete its first year of activity at the end of July, now has forty charter company members and the three British Corporations as honorary members. A set of rules of safety has now been adopted, with which all members are required to comply. The legal position of charter companies in the carriage of passengers and cargo has been examined thoroughly, and standard forms and documents have been prepared and issued to all members. These documents cover the companies under the terms of the Warsaw Convention, the Carriage By Air Act, and other regulations. All members of the Association have been asked to apply a recommended schedule of rates for flying passengers to Europe. By arrangement with the Board of Inland Revenue, payments by members to the B.A.C.A. may be allowed as trade expenses.

Bulletins have been issued frequently giving members details of the availability of fuel and petrol, and servicing and handling arrangements at airfields abroad, particulars of aircrew requiring employment and details of official publications of interest to charter companies.

B.E.A. INTERNAL SERVICES

NEARLY 52,000 seats a month are now available on services run by the English Division of B.E.A. Three new routes have recently been opened up between the Isle of Man and Glasgow, Jersey and Paris, Jersey and Rennes. At the same time Dakotas have replaced Ju. 52s on the London-Belfast and Liverpool-Belfast route, making available 15,000 seats each month on that route. Dakotas have also replaced Rapides on the London to Jersey route, making available 6,000 seats a month on that service. During March, airports in the English Division handled nearly 13,000 passengers, involving 3,303 aircraft movements.

HIGH PAYLOAD : The Cessna Aircraft Company's new Type 190, with a 240 h.p. Continental engine, has a useful load of 1,320 lb. and cruises at 160 m.p.h. The Type 195, which differs only in the power unit, has a 300 h.p. Jacobs engine, can carry 1,300 lb and has a cruising speed of 165 m.p.h. Both types have a range of more than 700 miles and are fitted with the cantilever spring strut undercarriage described briefly in *Flight* of May 8th.

BREVITIES

In future, applications will be accepted for operational engineers' licences on the basis of a revised examination and other requirements. Such licences will not be endorsed with authority to issue certificates of safety, and when certification duties are required application must be made for a separate aircraft maintenance engineer's licence. Copies of the revised syllabus may be obtained from the Ministry of Civil Aviation at Ariel House, Strand, W.C.2.

* * *

The Ministry of Civil Aviation is examining reports which suggest that Luqa, in Malta, may be unsuitable for continuous use by four-engined aircraft. It is probable that B.O.A.C. services will be re-routed, at least temporarily, to Castel Benito.

* * *

Mr. Van Leer has returned from his 30,000-mile tour of Europe, Africa and the Far East in a chartered K.L.M. Skymaster. The aircraft was immediately reconverted for normal schedule flying. The refrigerator, boiler, hot cupboards and water heaters for the aircraft were supplied by the G.E.C.

* * *

We understand that Dr. Humby, while in New Zealand with the L.A.M.S. freighter *Port of Sydney*, mentioned the possibility of his company placing six freight aircraft at Sydney.

* * *

Mr. T. R. Royle has been elected president of the Institute of Transport for the year 1947/48. He will take office on October 1st, 1947.

FROM THE CLUBS

THE breakfast patrol organized by the Herts and Essex Aero Club on Sunday, May 18th, proved a great success. Nine pilots defended Broxbourne Aerodrome and out of a total of eleven "raiders" only one, Mr. R. Fillingham, of Hatfield, got through. Mr. Fillingham, who was rewarded with a free breakfast, was flying what is believed to be the only Chipmunk trainer in this country (CS-DIO/X). Raiding aircraft came from Southend, Luton, Hatfield, Bedford and Sywell. It is hoped to arrange a return raid on Southend.

* * *

Cowes Aero Club celebrated the formal reopening of its new premises on May 17th. The club, which was re-formed last summer, is showing encouraging progress and an attractive club room looking across the airfield is now in use. The post-war founder of the club is Mr. Russell Gunton. Mr. Richard Turlington is the Secretary and Mr. E. G. Morgan is the Chief Flying Instructor.

* * *

S/L. R. L. Porteous has now taken over as C.F.I. at the Derby Aero Club and is putting in many flying hours with the new flying members. The social side of the club is also flourishing and we hear that the committee and members are extremely busy with arrangements for the International Air Rally which is being held on June 20th-21st, 1947. Several trips to Europe are planned by the Derby Club this summer.

The Gloucester Flying Club is holding an "At Home" and Air Display at Staverton airfield on July 6th. The show is planned to include a static exhibition in the hangars, and many well-known aircraft manufacturers and light aircraft owners have promised their support.

* * *

Sunday, June 1st, 1947, will mark yet another club reopening. At Ratcliffe airfield, the Leicester Aero Club are starting again with an "At Home" and invitations have been extended to all the flying clubs in the Midlands, local R.A.F. stations and auxiliary squadrons to visit the Leicestershire club by air.

The time of arrival for the arrival competition will be between 3.30 p.m. and 4 p.m., and during the afternoon there will be formation flying and aerobatics.

* * *

The Ultra Light Aircraft Association announce that it has now acquired a single-seater Comper Swift with a 75 h.p. Pobjoy engine. The machine, which was given to the Association by Mr. Angus Malcolm, an ex-R.A.F. pilot, is in need of some repair, but it will be reconditioned by the Association's experimental group and later on will be flown at as many air meetings as possible to "show the flag" on behalf of the Association.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

U.S.A.A.F. CLAIMS

German Figures Should be Published

IF you possess a long memory, you will recall that way back in 1944, or thereabouts, our American Allies were making some rather heavy bombing raids on Germany and enemy-occupied territory.

They made, at that time, astonishing claims regarding the number of opposing enemy fighters shot down. In view of the recent disclosures regarding the wildly exaggerated claims for the "Battle of Britain" period, it would be interesting to see published the Germans' own estimates of their fighter losses during the American raids.

This I consider to be important since as much emphasis was placed upon this whittling down of the enemies' fighter reserves as was placed upon the tonnage of bombs dropped.

One myth is as well destroyed as another.

A. SANSOM.

SURPLUS LIGHT AIRCRAFT

A Plea from Scandinavia

TO-DAY, two years after the capitulation, England and the U.S.A. still have surplus light aircraft with which they do not know what to do. At the same time countries such as Belgium, Norway and Denmark badly need such aircraft for use by clubs, associations and private owners.

I am not suggesting that these surplus machines should be sold to us at very low prices, although that would be a very welcome gesture and would help to create airmindedness. But I cannot understand why it was necessary after the capitulation to take away all the aircraft left in Belgium, Norway and Denmark by the Germans. Types such as the Fieseler Storch, Me Taifun, Junkers W 34, Siebel Si 20UD could have been used for this purpose.

There were, at least in Denmark, also a number of gliders which could well have been used by our gliding clubs, which are now in a hopeless position without new machines, and have to buy German-designed Olympias from British manufacturers! Why could we not have been allowed to keep the Olympias that were left here? Would it not have been a reasonable thing to let us keep the abandoned German machines as some small compensation for the hundred or more aircraft which the Germans grabbed from us during the occupation, and which they never returned?

Copenhagen. JÖRGEN C. C. ELHOLM.

[Our correspondent is mistaken in thinking that we in Great Britain have a surplus of light aircraft and gliders. We are, proportionately, as badly off as the countries he mentions.—ED.]

CROSS-WIND LANDING GEAR

Credit for Development Work

I WAS interested in reading the "American Newsletter" appearing in your April 24th issue and particularly the discussion of the cross-wind landing gear appearing under the sub-title "A New/Old Idea." I want to correct any impression that may exist that we do not give full credit to Mr. Maclaren for the development work he did in this connection. Before the project was made a major one by the Civil Aeronautics Administration, I acquired, through correspondence, a great deal of information on the Maclaren gear and had a discussion with Mr. Maclaren in London in the spring of 1945. Incidentally, I was quite surprised to find that although considerable progress had been accomplished and successful demonstrations made, there did not seem to be a very great interest in the project in England.

The chief interest in England appeared to be directed to the version of such a gear which contemplated cockpit control of the wheel angles. After a considerable study of the matter, we decided that it would not be desirable to add an extra cockpit control were it to be found possible to accomplish satisfactory results by an arrangement which operated automatically.

Therefore, the Civil Aeronautics Administration, in contracting with several firms in the industry, established performance specifications requiring automatic operation, which naturally led to the development of castering wheels with some sort of centring device and, of course, with anti-shimmying attachments. We have been very gratified with the results and have already tested several arrangements following the same basic principles but differing in specific configurations.

It is our belief that this development, which, in so far as basic conception is concerned, goes back to some of the planes flown in the earliest days of aviation, will prove extremely important not only for private-owner aircraft application, but also for all other types such as commercial, feeder line, and even transport. We fully expect that within a few years it will importantly affect our conception of airport design and location.

Administrator of Civil Aeronautics, U.S.A.

T. P. WRIGHT.

COCKPIT STANDARDIZATION

Critics Invited to Try

AS a "groundman" who has been concerned in a small way with standardization of controls, equipment and cockpit layout, it is indeed gratifying to find some interest shown in such matters by "Vertigo" and others, for a considerable amount of apathy exists in many quarters.

As remarked by Mr. Stanton, the layout of cockpit is not just cussedness, but the result of much thought. Just how much thought might surprise those people not actively concerned with aircraft design.

Consider the "Attacker" cockpit (*Flight*, May 15th, page 446.) No gunsight is shown, nor radar, both large items. Then imagine a twin-engined single-seater which duplicates engine instruments, and then, just for luck, fit an 18in × 14in naval chartboard. With these requirements to be fulfilled to the satisfaction of perhaps fifteen different pilots each with ideas of his own—well, I suggest the critics "have a go."

"JUST A P.B.D."

NOSEWHEEL OR TAILWHEEL?

A Question of Weight and C.G.

IN your illustrated description of the Vickers-Supermarine Attacker single-jet fighter the difficult question of nosewheel or tailwheel is again touched on. You state that the tailwheel undercarriage is appreciably lighter than the equivalent tricycle. This is undoubtedly true, since the main undercarriage must be capable of taking the full shock of landing, whether the third wheel be in front or behind. But the saving in weight is likely to be more apparent than real, and may actually end up as a loss when all relevant factors are provided for.

Due to the aft location of the power-plant, a tricky problem with the single-jet fighter is to get the C.G. far enough forward —and to keep it there while the fuel is consumed in flight. The relatively heavy nosewheel unit helps to balance the aircraft, and the necessary strengthening of the front fuselage to take nosewheel reactions further tips the scales. But if the nosewheel is removed, ballast must replace it and, moreover, be increased to compensate for the effect of a tailwheel and accessories near the rear end of a long fuselage.

From the point of view of weight it seems a poor exchange, and I think this aspect of the matter should be made clear. Weight-saving in the fighter class has become a greater problem than ever, and one wonders how many promising projects have been killed by their own weight. Furthermore, if weight reduction can thus be included among the attractions of the tricycle for certain limited applications the future of the type is assured—especially when power-steering generally takes the place of differential braking. KENNETH J. KEY.

FORTHCOMING EVENTS

May 29th.—Royal Aeronautical Soc. : Thirty-fifth Wilbur Wright Memorial Lecture "The Development of All-wing Aircraft." To be read by J. K. Northrop.

May 31st and June 1st.—Lochleven Aero Club Flying Meeting. Balado Airfield, nr. Milnathort, Kinross.

June 4th.—R.Ae.S. (Luton) : "Fuels and Oils for Aircraft Turbines," Dr. C. G. Williams, Ph.D.

June 14th and 15th.—Royal Artillery Aero Club rally. Thruxton Airfield.

June 14th.—Inst. of Physics : Summer Meeting : "Cathode Emission."

June 14th.—Air League of the British Empire : Display at Baginton Airfield, Coventry.

June 20th and 21st.—Derby Aero Club. International air rally. Burnaston Airport.

June 22nd.—Swiss Aero Club. International model contests.

SERVICE AVIATION

PRE-PRODUCTION PRENTICE: Percival's basic trainer will soon be coming off the production lines at Luton and Brough for delivery to the R.A.F. Flying tests have now been practically completed. In the *Flight* photograph above, the latest form is seen to embody swept-up wing tips, but the tail parachute will, of course, be removed. The engine is a 295 h.p. D.H. Gipsy Queen

Royal Air Force and Naval Aviation News and Announcements

Appointments

THE Air Ministry announces the following appointments: Air Vice-Marshal Thomas Melling Williams, C.B., O.B.E., M.C., D.F.C., to be Commandant of the R.A.F. Staff College, Bracknell. Air Vice-Marshal James Donald Innes Hardman, C.B., O.B.E., D.F.C., to be Assistant Chief of the Air Staff (Operations), Air Ministry.

Air Vice-Marshal Williams has been Assistant Chief of the Air Staff (Operations) since August, 1944, and was formerly Deputy Air Commander, Eastern Air Command (South-East Asia) from December, 1943. Previously he had been Air Officer Commanding, R.A.F. Bengal, and from March, 1942, until January, 1943, was Senior Air Staff Officer at Air Headquarters, India.

Air Vice-Marshal Hardman has been Air Officer in Charge of Administration, Air Command, Far East (formerly Air Command, South-East Asia) since January, 1946, and was formerly Air Officer Commanding No. 232 Group, A.C.S.E.A. Previously he was Deputy Air Commander, R.A.F. Element, A.C.S.E.A., and before taking up this appointment in December, 1944, he was for four years at the Air Ministry, first in the Directorate of Plans and afterwards as Director of Military Co-operation.

Moscow Conference Service

NO. 24 Squadron, Transport Command, flying Lancasters Mks I and II, operated the air courier service between this country and Russia during the recent Four-Power Conference in Moscow.

Flying every day, with the exception of Sundays, a total of 98,790 miles were flown and 159 passengers, 20,511 lb of freight and 27,523 lb of mail were carried. The number of flights scheduled was 42, of which seven were cancelled owing to bad weather and only one because of aircraft unserviceability.

S/L. D. Iveson, D.S.O., D.F.C., the officer in charge, was specially chosen for the task because he had just recently returned from commanding the R.A.F. party carrying out the winterization trials at Nomes, Alberta, Canada.

AT THE INVESTITURE: S/L. Dinwoodie (George Cross) and Cpl. Garred (George Medal) leaving Buckingham Palace after receiving their decorations from the King for their share in saving Lubeck from devastation when an ammunition train caught fire

A.T.C. Training

A NEW training syllabus, shortly to be introduced in the A.T.C., will lay emphasis on the value of sports and team games. It is divided into three main stages: (1) A period of basic training covering drill, aircraft recognition, morse, map reading and general subjects. (2) A course of training for the Proficiency Certificate. (3) Separate classes for those entering aircrew, general trades and technical branches.

Educational Fund

THE trustees of the Airborne Forces' Security Fund have announced the inauguration of an educational endowment fund to assist widows of airborne personnel in the education of their children. Brigadier P. L. Spafford, the controller of the fund, states: "It is the ambition of the trustees that the sons and daughters of the gallant members of the airborne forces who gave their lives for the country should receive the same type of education as they would have done had their fathers survived. Undoubtedly this would be the wish not only of those who glided or parachuted into battle for the last time, but of the public who have so generously supported the Airborne Forces' Security Fund since its inauguration in 1942." From the showing of "Theirs is the Glory," the

No. 149 Squadron, R.A.F. — "Fortis Nocte" (Strong by Night).

No. 104 Squadron, Royal Air Force—"Strike Hard."

No. 205 Squadron, R.A.F. — "Pertama di-Malaya" (First in Malaya).

No. 86 Squadron, R.A.F.—"Ad libertatem Volamus" (We Fly to Freedom)

No. 236 Sqn., R.A.F. —Speculati nuntiate (Having Watched, Bring Word).

No. 237 Squadron., R.A.F.— "Primum Agmen in Cælo" (The Vanguard in the Heavens.)

SERVICE AVIATION

film of the Arnhem airborne operation, the fund received £50,000 from collections in cinemas all over the country.

Still No Treating

AMONG R.A.F. Officers' Mess regulations which are to continue is that which bans "treating" between members of the same mess.

102 (Ceylon) Squadron War Record

SOME three hundred copies of 102 (Ceylon) Squadron's war record are still available. Together with all information, they may be obtained from R. F. Gomm, 92, Forest Road, Loughton, Essex.

Hawkinge as W.A.A.F. Centre

PLANS are in hand for making the famous fighter station of Hawkinge, in Kent, a centre through which all officers, N.C.O.s and airwomen will pass. It will be commanded by a W.A.A.F. officer.

The plan is still, as yet, in the formative stage, and for the present it is proposed to restart the N.C.O.s' School there—it was formerly at Digby—and later bring the Service re-entrants depot from Wilmslow, near Manchester, to continue the training programme. Eventually the Recruit Centre will also be located at Hawkinge, together with an Officer Cadet Training Unit.

Presumably the days of Hawkinge as an interceptor station are finished.

R.A.F.V.R. Pilots

THERE are still vacancies for qualified pilots in the newly formed R.A.F. Volunteer Reserve. Pilots, who must have reached R.A.F. "wings" standard, will get forty hours' flying a year, mostly at week-ends. They will also be required to attend 15 days' continuous training each year. For the period spent in camp the same rates of pay and marriage allowance as regular R.A.F. personnel will be granted. In addition, all V.R. pilots will receive an annual retaining fee of £35.

Four A.A.F. Regiment Squadrons

FOUR Light A.A. Squadrons of the Auxiliary Air Force Regiment will begin recruiting on June 1st in the Middlesex, Edinburgh, Gloucester and West Riding areas. The chief need is for ex-R.A.F. Regiment members, but other men, particularly those with gunnery experience, will also be welcomed.

Each squadron will be fully mobile and equipped in the same manner as a regular Regiment squadron, as a first-line defence unit for local A.A. and ground defence and will combine for exercises with the local A.A.F. flying squadron.

Headquarters will be: No. 2604 (Middlesex) Squadron, Stanmore; No. 2603 (Edinburgh) Squadron, Turnhouse; No. 2501 (Gloucester) Squadron, Filton; No. 2609 (West Riding) Squadron, Yeadon.

Training will take place at week-ends, evenings, and at an annual 15 days' camp. There is an annual bounty for men, as well as a travelling allowance and pay or expenses allowance for all ranks for training periods. Applicants should write to the adjutant of the squadron they wish to join.

Britannia Shield

THE second annual competition for the Britannia Shield will be held in England during "Battle of Britain" week, September 15th-21st.

Competing nations—Belgium, Czechoslovakia, Denmark, France, Greece, Holland, Norway, U.S.A., India and the Dominions—will be asked to send teams to represent them in boxing, cross-country running, fencing, shooting and swimming. The R.A.F. will, of course, enter teams for each of these contests.

All arrangements are being made by a special committee of the R.A.F. Sports Board under the chairmanship of Air Chief Marshal Sir Arthur Barratt, K.C.B.

The Britannia Shield is made of oak taken from the ruins of the City of London Guildhall, and was presented by E. S. Virpsha, a Polish ex-officer of the R.A.F. Its purpose is to commemorate and foster the spirit of comradeship between the armed forces of those nations which took part in the Battle of Britain or were assembled on British soil between the years 1940 and 1945.

"Underground" Group Reunion

MEMBERS of a famous French and Belgian underground group who helped a local bomber pilot to escape and return to England in 1943, will be entertained by the Richmond Branch of the Royal Air Forces Association at a reunion dinner-dance to be held at the Territorial Drill Hall, Parkshot, Richmond, Surrey, on Saturday, June 7th. A.V-M. Sir Basil E. Embry, K.B.E., C.B., D.S.O., D.F.C., A.F.C., chairman of the R.A.F. Escape Society, will be present. The founder of the underground group concerned, a young Belgian nurse who was recently awarded the George Medal for her work, has also been invited.

PRIDE BEFORE THE FALL : The paratroops, who made the live drops at the recent demonstration staged by the R.A.F. School of Air Support, pose for *Flight's* cameraman.